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MEMOIRS OF THE HOURGLASS CRUISES

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DRIFT BOTTLE ANALYSES OF EASTERN GULF OF MEXICO SURFACE CIRCULATION

By

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ABSTRACT

A total of 4,460 drift bottles was released in continental shelf waters between Tampa Bay and Ft. Myers, Florida, during Project Hourglass, a 28 month (1965 to 1967) systematic sampling program. The number of recoveries was 1,415 or 31.73% of those released. Coastlines where bottles were recovered were divided into five geographic areas for analyses. Winter releases resulted in the greatest number of returns from the Florida east coast and Keys, and few or none from other areas. Spring and summer releases resulted in high percentages of returns from the lower west Florida coast (Area I), primarily between Tampa and Ft. Myers. The greatest number of returns from the western Gulf of Mexico (Area IV) was from summer and fall releases. A combination of Gulf of Mexico Loop Current data from other cruises during this period, temperature and salinity measurements taken on the Hourglass cruises, and wind analysis aided our interpretation of possible mechanisms associated with drift trajectories. A sequential pattern of Loop Current development (intrusion, spreading, eddy formation, decay) has been well documented by hydrographic and satellite data.

Recent monitoring via satellite imagery has shown, however, that a well established seasonal pattern cannot always be anticipated and that short term variation in its position can be very sig-

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nificant. Anticyclonic and cyclonic eddy complexes are presented as important features which may have influenced circulation of surface waters from the Hourglass sampling area toward the western Gulf. A northerly longshore current frequently observed in spring and summer is attributed to small scale cyclonic eddies associated with the Loop Current. Wind rose data for selected periods suggest that local winds can strongly influence surface circulation in nearshore areas, and may also serve as a mechanism for transport of surface waters into areas dominated by the Loop Current.

INTRODUCTION

The Florida Department of Natural Resources Marine Research Laboratory conducted a series of cruises on the continental shelf between Tampa Bay and Ft. Myers from August 1965 to November 1967. Designated the Hourglass cruises, each of 16 permanent stations (Table 1 and Figure 1) was sampled on a monthly basis to systematically investigate the marine flora and fauna of the continental shelf and overlying waters to a depth of 40 fathoms (Joyce and Williams, 1969). Drift bottles were released at each station to document surface circulation.

TABLE 1. LOCATION OF HOURGLASS STATIONS

Station	Latitude*	Longitude*	Established Depth ft.	Established Depth meters	Approximate Nautical Miles Offshore*
A	27°35'N	82°50'W	20	6.1	04-due W of Egmont Key
B	27°37'N	83°07'W	60	18.3	19-due W of Egmont Key
C	27°37'N	83°28'W	120	36.6	38-due W of Egmont Key
D	27°37'N	83°58'W	180	54.9	65-due W of Egmont Key
E	27°37'N	84°13'W	240	73.2	78-due W of Egmont Key
+F	27°03'N	83°14'W	128	39.0	42-due W of Venice
+G	26°44'N	82°41'W	78	23.8	22-due W of Gasparilla Island
+H	26°36'N	82°16'W	22	6.7	03-due W of Captiva Pass
I	26°24'N	82°06'W	20	6.1	04-due W of Sanibel Island Light
J	26°24'N	82°28'W	60	18.3	24-due W of Sanibel Island Light
K	26°24'N	82°58'W	120	36.6	51-due W of Sanibel Island Light
L	26°24'N	83°22'W	180	54.9	73-due W of Sanibel Island Light
M	26°24'N	83°43'W	240	73.2	92-due W of Sanibel Island Light
+N	27°03'N	83°14'W	128	39.0	42-due W of Venice
+O	27°19'N	83°00'W	78	23.8	21-due W of Longboat Key
+P	27°35'N	82°51'W	20	6.1	05-due W of Egmont Key

*U. S. Coast & Geodetic Chart 1003 dated June 1966
+Red Tide Stations

At the time of Hourglass, knowledge of surface circulation derived from drift bottle releases on the West Florida Shelf consisted mainly of studies reported by Chew (1955a, 1955b), Hela et al. (1955), Chew et al. (1962), Tolbert and Salsman (1964), and Ichiye et al. (1973). Hela and associates used drift cards to plot movement of floating fish killed by red tide and found that "floating particles" were affected by wind drift as well as permanent currents. Bottles released from a stationary platform off Panama City during a 28 month study by Tolbert and Salsman (1964) showed repeated returns from the east coast of Florida and the Florida Keys in addition to other

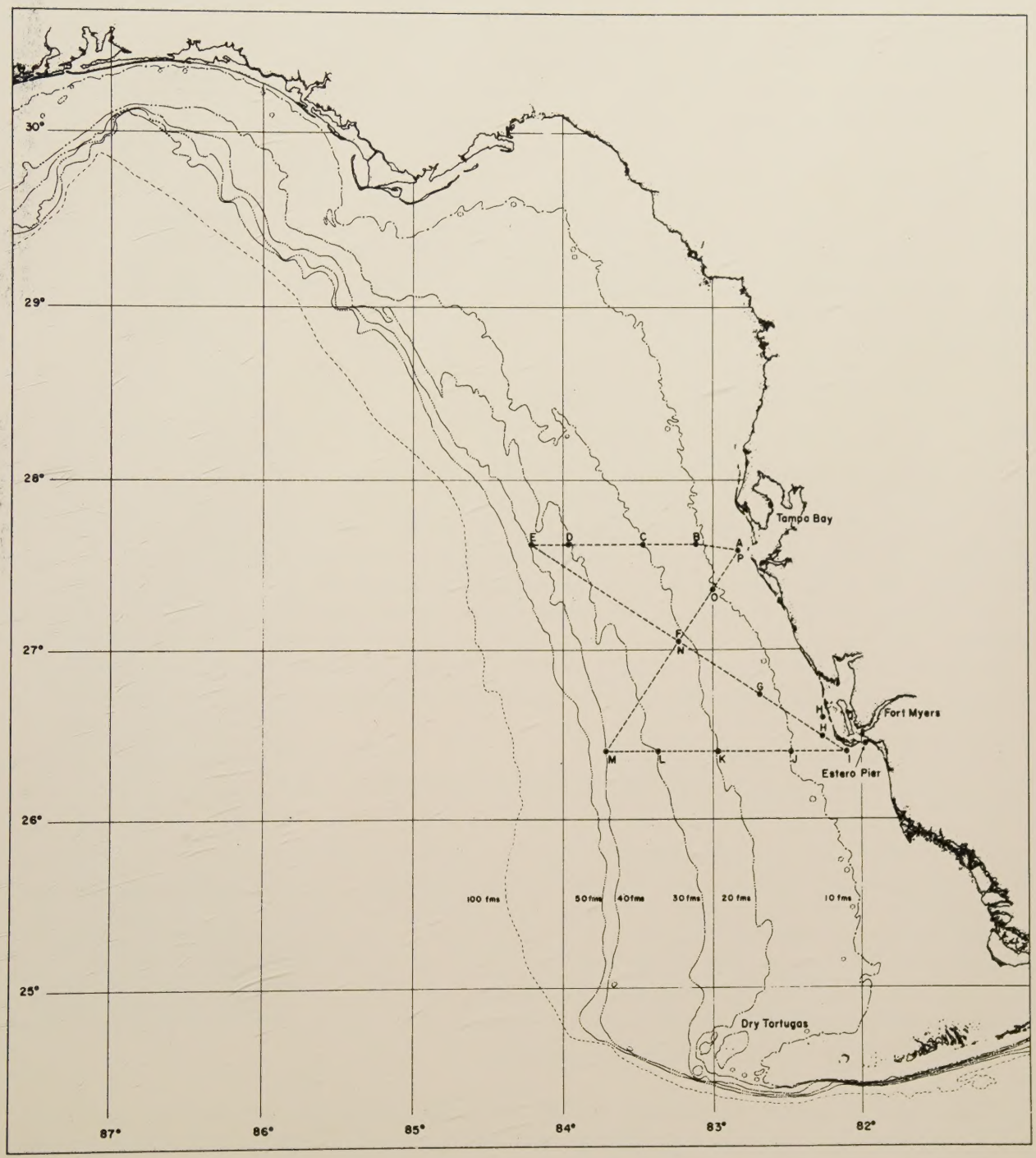


Figure 1. Hourglass cruise pattern and station locations.

areas. This indicated that water on the continental shelf near Panama City is probably influenced by the Loop Current, a dominant offshore current. Ichiye et al. (1973), reporting on Gaul and Boykin's (1964-1965) drift bottle data from releases 60-150 miles off the northeast Gulf coast, stated that there were distinct seasonal trajectory patterns. In late summer and early fall a high percentage of returns were from the western Gulf, while at other times bottles were transported southward. Chew's (1955a) research on red tide off Florida's west coast suggested that water on the continental shelf was affected by a cyclonic eddy driven by the Loop Current. Chew (1955a) also indicated two eddies driven by this current; one extending from Mississippi to Panama City, and the other off Tampa Bay extending outward to the 100-fathom line (183 m).

Other researchers in the area have utilized hydrographic sampling techniques to determine current structure. Among these studies are those by Nowlin et al. (1968), Leipper (1970), Austin (1971), Maul (1975), and multi-institutional sponsored projects such as EGMEX (Rinkel, 1971), ESCAROSA (Rinkel and Jones, 1973), and MAFLA (SUSIO, 1975). All of these studies point to a highly dynamic multiple eddy system over the West Florida Shelf which is at times influenced by a strong, anticyclonic, offshore current, the Loop Current.

ACKNOWLEDGMENTS

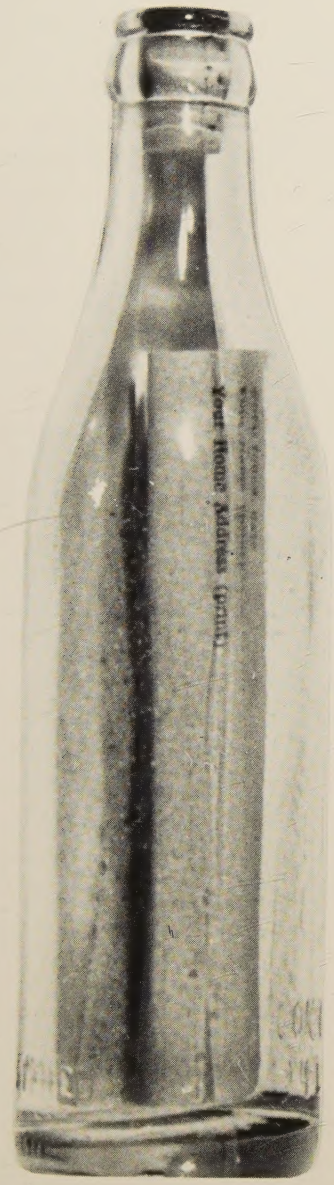
Any project as complex as Hourglass requires the cooperation of many individuals to whom we are indebted. Special thanks are due to Dr. E. Kenneth Gray for his assistance with data recording, and Lucinda Grant for her patience in typing all of the graphic presentations. Sincere gratitude is extended to Mrs. Gay B. White for her many hours of meticulous work recording data, distance computation, and editorial assistance. We are especially grateful to Mr. M. O. Rinkel (SUSIO), Dr. George A. Maul (NOAA/AOML) and Mr. John Brucks (NOAA/NMFS) for their guidance and suggestions concerning this paper. The editorial assistance of Mr. E. A. Joyce, Jr., Director, Division of Marine Resources, Mr. Dale S. Beaumariage, Chief, Bureau of Marine Science and Technology, Ms. Karen A. Steidinger (FDNR/MRL) and Ms. Terry Cone (FDNR/MRL) is greatly appreciated.

METHODS AND MATERIALS

Drift bottles used in this study were eight-oz., (236 ml), clear glass bottles containing a self-addressed, postage-paid card, imprinted in English and Spanish (Figure 2), requesting the finder to complete pertinent information and return the card to the laboratory. Cards were serially numbered for identification and placed in bottles so that the instructions, "Break This Bottle," were visible. This lessened the chance of damaging the card and possibly destroying the identification number if the finder attempted to remove the card without first breaking the bottle. The bottles were not ballasted and were sealed with a cork. Although no reward was offered, a form letter was sent thanking respondents for their assistance.

Drift bottle data were catalogued according to station, bottle number, recovery date, area, locality, coordinates, days adrift, and nautical miles/24 hrs (nmi/day) (Appendix I). A Minerva Map Measure was used to calculate nautical miles travelled. Distance was determined by following the most probable direct water route.

Coastlines where bottles were recovered have been divided into five areas (Figure 45. See pages 33 to 69) to record the number of bottles recovered from each station in a particular area. Area I



Postage Will Be Paid by Addressee

BUSINESS REPLY CARD
FIRST CLASS PERMIT NO. 5617 — ST. PETERSBURG, FLORIDA

Postage Will Be Paid By
FLORIDA STATE BOARD OF CONSERVATION
Marine Laboratory
Building F, Maritime Base, Bayboro Harbor
P. O. Drawer F
St. Petersburg, Florida

BREAK This Bottle

No. 11012

Urgent — **Please Return**
Urgente — Por Favor —
devuelva este papel aste
con la siguiente informacion.
Fecha y lugar donde la en contro.

Drift Bottle Study ! ! ! !

PLEASE PRINT

Where Found?
Donde? .....

Date
Fecha .....

Your Name — Su Nombre: .....

Address — Domicilio: .....

Florida State Board of Conservation.
Thank You.

Figure 2. Drift bottle and return postcard.

extends from latitude 28° N southward along the Florida coast to Cape Sable. Area II includes the Florida coastline north of Area I to just west of Cape San Blas. Area III extends westward from Cape San Blas, Florida, to the Mississippi Delta. Area IV is the Texas and remaining Louisiana coastline. Area V includes the Florida Keys and the entire east coast of Florida. The percentage of return was calculated for each Hernan Cortez (HC) cruise in the Hourglass Program and for each area (Tables 2 and 3). Bottles recovered outside of these designated areas were not included in the area totals but are recorded under "others" in all pertinent tables.

TABLE 2. PERCENT RETURNS BY CRUISE

HC NO.	RETURNS	%	HC NO.	RETURNS	%	HC NO.	RETURNS	%
18	25	15.63	28	50	31.25	37	58	36.25
19	33	20.63	29	57	35.63	38	57	35.63
20	45	28.13	30	50	31.25	39	79	49.38
21	47	29.38	31	45	28.13	40	77	48.13
22	57	35.63	32	28	17.50	41	77	48.13
23	35	21.88	33	42	26.25	42	60	37.50
24	39	24.38	34	47	29.38	43	51	31.88
25	43	28.67	35	38	25.34	44	54	33.75
26	56	35.00	36	63	39.38	45	42	26.25
27	60	37.50						

Total Returns – 1415
% Returns – 31.73

TABLE 3. SUMMARY OF RETURNS BY AREA

	I	II	III	IV	V	OTHER
1965	16	0	1	36	145	N-1 M-8
1966	165	16	19	25	323	N-2 C-1 M-1
1967	196	27	1	44	380	N-5 M-3
Total	377	43	21	105	848	21
% Returns	26.64	3.04	1.48	7.42	59.93	1.48

N – North
M – Mexico
C – Cuba

Hydrographic measurements such as salinity and temperature used in conjunction with drift bottles can at times increase the efficiency of identifying water masses, and tracking currents. Salinity and temperature data (Appendix II) were recorded at every Hourglass Station using techniques described by Joyce and Williams (1969).

Gulf of Mexico water with a salinity in excess of 36.50 °/oo, when associated with a certain temperature range, e. g. 21-23° C, is considered by many oceanographers as an indicator of the Loop Current (Wust, 1964; Jones et al., 1973). The 22° C isotherm at 100 m or the 20° C isotherm at 150 m have also been used by investigators as an indicator of the Loop Current (Leipper, 1970; SUSIO, 1975). According to Maul et al. (1974) the isotherm at 100 m is approximately 20 km to the right of the left-hand boundary of the current facing downstream (cyclonic edge). Water from the Hourglass samples with a minimum salinity between 36.50 °/oo and 36.75 °/oo, and a coincident temperature of 21.0°C to 23.0° C, was considered evidence of Loop Current water intruding into the release area based on data presented by Nowlin and Hubertz (1972) and others. In our analysis of the eastern Gulf current structure, we have compared the results of Hourglass drift bottle returns, Hourglass temperature and salinity data, and Leipper's 1965-1966 bathythermograph data showing the topography of isothermal surfaces in the Gulf of Mexico. We have also charted, where applicable, Loop Current positions presented by SUSIO (1975), which were within the same time frame as certain Hourglass cruises. The results of Nowlin, Hubertz, and Reid's June 1967 cruise (Nowlin et al., 1968) were also compared with Hourglass return data.

The only empirical data obtained by using drift bottles were the points and dates of release and recovery. During interpretation of returns, many factors must be considered to present the least biased results. The largest percentage of bottles returned were found stranded on beaches, thus the amount of coastline development was important. For example, a bottle that was beach cast along the Miami shore would probably be recovered in a day; but one washing ashore on an uninhabited coastline may not have been found for several months or years. Also, a bottle may have been refloated by the next high tide, buried by wind and sand action, or trapped among mangrove roots. Derivation of current velocities from drift bottle studies must therefore take into account such delays in recovery. The most accurate results can be obtained by considering the initial recovery of the release group as being representative of current speed and the most direct route from the release point. Nautical miles travelled per day were not calculated for recoveries made more than one year after release; but these recoveries and a few "suspect" returns were included in graphic presentations.

The possible influence of local winds on initial drift bottle movement was evaluated for 10 cruises with returns from recovery Area I. These cruises were selected randomly from a list of 19 which met the following conditions: (a) returns in recovery Area I from Stations A, H, I, and P (5 nmi or less from shore) and recovered in eight days or less; (b) returns in recovery Area I from stations greater than 5 nmi from shore and recovered in 14 days or less. Recovery Area I was selected as the test area because it was the only area where short term recoveries could allow good comparisons of drift times with winds. Additionally, the Hourglass cruise pattern was directly offshore of the two weather stations from which wind data was obtained. Four cruises, randomly selected from a list of eight cruises which had no returns from Area I, were used to evaluate wind influence on initial drift bottle transport in an offshore direction.

Daily resultant wind data from Tampa and Ft. Myers, Florida were used to construct wind roses (Figure 3. See page 22) for the periods following drift bottle releases. Resultant winds were the most readily available form of summaries for wind direction and speed, on a daily basis, provided by Local Climatological Data records (U. S. Department of Commerce, 1965-1967). A

chronological sequence of resultant wind vectors for post-release periods of the selected cruises is displayed in Figures 4-44 (see pages 22 to 32). The wind roses represent a time progression of daily resultant winds for the Tampa and Ft. Myers areas. In this sense they may have been indicative of the general wind field along the coast, though not always similar to the winds in offshore areas.

RESULTS AND DISCUSSION

A total of 4,460 drift bottles was released during the Hourglass cruises. The number recovered was 1,415 or 31.73% of those released. Percentage of the total returns from each designated area are presented in Table 3 and seasonal comparisons of area returns are in Table 4. Charts of the Gulf of Mexico showing drift bottle release and recovery locations are presented by cruise number in Figures 45-83 (see pages 33 to 69).

Recoveries for HC 18 (3 through 8 August 1965) (Figure 46) were divided between the Florida east coast and the Texas Gulf coast with one recovery in Louisiana and one in Mexico. Bottle #4806, released at Station I, travelled 6.7 nmi/day (3 miles west of the mouth of the Colorado River, Texas, Area IV). The earliest east coast return was Bottle #4847, released at Station F, recovered in Hobe Sound (9.3 nmi/day). Offshore releases (Stations C, D, E, F, K, L, M, N) on both transects were recovered from the western Gulf while inshore (Stations A, B, G, H, I, J, O, P) releases travelled in both directions. Bottles released at the same station were recovered from opposite locations in several instances.

There was an increased number of returns from the western Gulf (Area IV) during HC 19 (30 August through 5 September 1965) (Figure 47). Fifteen bottles were recovered from Area IV and thirteen from the east coast of Florida (Area V). Bottle #2074, released at Station H, travelled 27.7 nmi/day to Mustang Island, Texas, and Bottle #2110, released at Station K, travelled 27.7 nmi/day to Wabasso, Florida. These were the highest drift rates for Areas IV and V. Figure 48 shows that the Loop Current had not penetrated far into the Gulf by 17 July; however, by mid-September (Figure 49) an eddy had detached from the Loop Current in the northeastern Gulf. Such eddies or eddy complexes have been suggested as westward transport mechanisms (Jones et al., 1973).

Hurricane Betsy traversed the eastern Gulf of Mexico and crossed the Louisiana coastline soon after HC 19 drift bottle releases. Resulting winds and alteration of currents could easily have affected movement of drift bottles. A tropical storm (Debbie) moved north through the central Gulf of Mexico between 26 and 29 September, and may also have affected drift bottles released earlier during HC 19. Therefore, storms and/or Loop Current eddies could have contributed to the westerly transport of bottles. During HC 20 (4 through 14 October 1965) (Figure 50) all returns except those inshore from Stations A and H were from the Florida east coast and Keys (Area V), or west of the Mississippi River (Area IV). The earliest returns were Bottles #0180, released at Station K, recovered at Ft. Pierce, Florida (22.8 nmi/day), and #0223, released at Station O, recovered at Tamaulipas, Mexico (5.1 nmi/day).

The general wind field for the four days following release was variable with resultant wind speeds usually 5-10 mph (Figures 4 and 5). Between 7 and 10 October winds blew in the sector bounded by 50-100°. Three of the four Station A recoveries were made during this period at inshore locations. Station H returns (70%) were those from inshore locations to the north of the release point, which had drift periods of 13 days or more. The Ft. Myers resultant wind on day of release (6 October) was longshore in a northerly direction, followed by four days of light resultant winds toward the 360-100° sector (Figure 5).

TABLE 4. SEASONAL COMPARISONS OF DRIFT BOTTLE RETURNS BY YEAR AND AREA

	WINTER						SPRING						SUMMER						FALL					
	I	II	III	IV	V	OTHER	I	II	III	IV	V	OTHER	I	II	III	IV	V	OTHER	I	II	III	IV	V	OTHER
HC 22																			HC 19					
Dec. 65	5			2	49	N-1	Mar. 65	No Releases					June 65	No Releases					Sept. 65			1	15	13	M-4
HC 34							HC 25						HC 28						HC 31					
Dec. 66	1	1		1	44		Mar. 66	24				19	June 66	18	1	1	8	21	C-1	Sept. 66	17	4		5	19	
							HC 37						HC 40						HC 43					
Dec. 67	No Releases						Mar. 67	10	1	1	2	43	N-1	June 67	37	1			39		Sept. 67	3			9	38	M-1
																			HC 20					
Jan. 65	No Releases						Apr. 65	No Releases					July 65	No Releases					Oct. 65	11			5	26	M-3
HC 23							HC 26						HC 29						HC 32					N-1
Jan. 66	9				26		Apr. 66	2	5	14	2	33	July 66	25	3	1	2	26		Oct. 66	2			4	20	M-1
HC 35							HC 38						HC 41						HC 44					
Jan. 67	2				36		Apr. 67	24	15		4	14	July 67	47	1		9	20		Oct. 67	4				50	
													HC 18						HC 21					
Feb. 65	No Releases						May 65	No Releases					Aug. 65				10	14	M-1	Nov. 65				4	43	
HC 24							HC 27						HC 30						HC 33					
Feb. 66					38	N-1	May 66	43	1	2	1	13		Aug. 66	18	1	1	2	28		Nov. 66	6				36	
HC 36							HC 39						HC 42						HC 45					
Feb. 67					62	N-1	May 67	37	1			38	N-3	Aug. 67	32	8		15	5		Nov. 67				5	35	M-2
Total	17	1	0	3	255	3		140	23	17	9	160	4		177	15	3	46	153	2		43	4	1	47	280	12

N – North
M – Mexico
C – Cuba

Recoveries for HC 21 (8 through 14 November 1965) (Figure 51) did not show as wide a distribution over the Gulf of Mexico as those from previous cruises. There were four recoveries from Texas possibly influenced by Loop Current eddies (Figure 52). Bottle #5120, released at Station L and recovered at Padre Island, travelled 4.1 nmi/day. All other returns, including those from the inshore stations, were from the Florida east coast. Bottle #5079, released at Station H, was found at Juno Beach (14.5 nmi/day).

Wind direction varied during the seven days following release, though strongest resultant winds were in the sector bounded by 200-320° (Figures 6 and 7). This and the lower position of the main Loop Current (Figure 52) may have provided initial movement of drift bottles into a south-flowing longshore current.

HC 22 (3-14 December 1965) (Figure 53) showed an increase in returns from the east coast of Florida (Area V). There were 49 Area V returns. This increase could again have been influenced by the low position of the Loop Current. Bottle #5279 released at Station L, recovered 5 miles south of Indian River at the N. St. Lucie County Line, had the highest drift rate (19.8 nmi/day). Two bottles released at Station D were the only returns from Area IV. Bottle #5192 had the highest drift rate for that station (4.8 nmi/day).

Salinities for HC 18-22 did not indicate the presence of Loop Current water inside the cruise track. However, several surface salinities from HC 19 and 22 were 36.00 °/oo or above, which we considered evidence of oceanic intrusion. Topographies of the 22° C isothermal surfaces for the periods of 10 through 24 August 1965, 11 through 25 September 1965, and 26 November through 5 December 1965 (Leipper, 1970), and of the 20° C isotherm at 150 m (Figures 49 and 52), show the offshore placement of the Loop Current in relation to our sample area during this time.

All recoveries from HC 23 (3 through 14 January 1966) (Figure 54) were from the east coast of Florida (Area V), except for six recoveries in lower Tampa Bay released at Station P, and one at Sanibel Island released at Station I. A similar recovery pattern was shown for HC 24 (7 through 15 February 1966) (Figure 55); all recoveries were from the Florida east coast and Keys (Area V). Initial recovery from HC 23 releases was Bottle #5444, released at offshore Station M, recovered at Lauderdale-by-the-Sea (14.2 nmi/day). Initial recoveries from HC 24 releases were Bottles #5592 and #5593, released at offshore Station L, and Bottle #5603 released at Station M. These were all at Ft. Pierce (17.3 nmi/day). Topographies of the 22° C isothermal surfaces for 10 through 21 February 1966 (Leipper, 1970), and of the 20° C isotherm (Figure 56) for 8 through 20 February, showed the Loop Current in what Leipper considers its "winter formation." When the current was in this position, it could exert a substantial influence on shelf circulation in the Hourglass area by a process of entrainment, as suggested by drift bottle returns for HC 23 and 24. Salinity data for these cruises showed evidence of oceanic waters at most offshore stations.

Wind roses for an eight day period following HC 23 releases from Stations I and P revealed a wind field in a general offshore direction, with the exception of days 3 and 4 (Figures 8 and 9). There was a high recovery rate of bottles inshore from Station P (60%). One bottle was reported seven days after release; its movement was possibly influenced by combined tidal current and wind shift between days 2 and 4.

Nineteen HC 25 (3 through 22 March 1966) returns (Figure 57) were from Area V, while 24 recoveries were from Area I (Stations A, H, and P). All 10 bottles released at Station H were recovered; several had a drift rate of 24 nmi/day. The highest drift rate to Area V for HC 25 releases was Bottle #5641, released at Station G, and recovered at Vero Beach (9.4 nmi/day).

Returns from Station A and H showed good correlation with the post-release wind conditions recorded at Tampa and Ft. Myers. Seventy-one percent of the recovery Area I returns from Station A occurred on 5 March 1966 along St. Petersburg Beach, north of the release point. Moderately strong winds in a northerly "onshore" direction were indicated by Tampa wind data for 3 March through 4 March. The Tampa resultant wind vector for 5 March was toward 110° approximately 12.5 mph (Figure 10). Wind vectors from Ft. Myers data indicated a similar pattern of shift in wind direction during the three days following release (Figure 11). All of the Station H returns from recovery Area I were made within two days of release.

A marked separation in current pattern was evident during HC 26 (6-13 April 1966) (Figure 58). Inshore waters moved north as shown by an unusually large number of returns from Area III. Area V continued to have the highest percentage of returns from bottles released at both inshore and offshore stations. Highest drift rates were: Area I, Bottle #5742, released at Station A (2.7 nmi/day); Area II, #5828, released at Station I (2.7 nmi/day); Area III, #5877 and #5878, both released at Station 0 (6.0 nmi/day); Area V, #5696, released at Station L (8.6 nmi/day).

The decrease in southerly drift bottle rates to Area V from releases made during HC 25 and 26 may have been a consequence of diminished southerly net transport of shelf water in the Hourglass area during this time. This may be associated with "spring intrusion" (Leipper, 1970), when the Loop Current is not immediately influencing bottle transport. Salinity and temperature data for these months did not indicate Loop water on the shelf. However, oceanic intrusion can be inferred from surface salinities at offshore stations (Appendix II).

Returns from HC 27 (2 May through 12 May 1966) (Figure 59) still indicated the influence of "spring intrusion." The highest percentage of returns occurred in Area I; however, there was evidence of a northerly current set. The highest drift rate for returns from Area I was 4.0 nmi/day for Bottle #6102, released at Station B, recovered at Panama City (2.8 nmi/day). Bottle #6028, released at Station F (2.2 nmi/day) was the only recovery in Area IV. Area V's earliest recovery was Bottle #6020, released at Station E (17.4 nmi/day). The largest number of recoveries in Area V had been released at offshore stations. Surface salinities for this cruise indicated intrusion and mixing of oceanic waters.

Three of the five returns from Station A were directly inshore, on the day of release (2 May). The Tampa wind vector for this date was toward 10°. A combination of strong afternoon seabreeze and tidal effect probably influenced initial drift of these bottles. Station P bottles were released on a day which was characterized by moderately strong resultant winds toward 260° at both weather stations (Figures 12 and 13). Resultant winds were toward the coastline during the next eight consecutive days. Initial drift bottle recoveries were made between days 8 and 11. Three stations further offshore (J, N, O) also had high recovery rates, within a two-week period, in recovery Area I. Wind rose patterns suggested a directional influence on drift bottle movement (Figures 14 and 15).

Returns from HC 28 (6 through 14 June 1966) (Figure 60) were more widely distributed. There were 18 returns from Area I, all from inshore stations, and all north of release points. This again showed the influence of a northerly longshore current. Bottles #6207 and #6210, released at Station H, were recovered at Lido Beach (15.4 nmi/day). Area II's single recovery, #6142 released at Station B, travelled 1.3 nmi/day. Area III also had one recovery, #6199, released at Station G (1.1 nmi/day). Recoveries from Area IV extended to the Mexican border. Bottle #6276, released at Station O, was recovered at the mouth of the Rio Grande (2.9 nmi/day). Area V's earliest recovery was #6255, released at Station N, recovered at Jensen Beach (11.8 nmi/day). Recovery #6152,

released at Station C, was returned from Havana, Cuba (1.1 nmi/day). Leipper's (1970) surface contours for June 1966, and Figure 61 show that the Loop Current had penetrated to just below the Mississippi Delta. Only two surface salinities suggested the presence of oceanic intrusion.

Hurricane Alma moved north along the coastal waters of west Florida, during 8 through 9 June, and probably influenced drift bottle trajectories. Winds preceding and during the passage of the hurricane through the transect area were in a southwest-to-west direction. Winds following the passage of the hurricane onto the north Florida coast shifted toward a north-to-east direction of flow.

Returns from HC 29 (2 through 7 July 1966) (Figure 63) HC 30 (1 through 7 August 1966) (Figure 65) and HC 31 (31 August through 6 September 1966) (Figure 66) showed essentially the same patterns. Returns were rather evenly divided between Areas I and V, with a few scattered returns from other areas. Returns from Areas I and II were from releases at inshore stations and strongly influenced by a northerly longshore current. Most offshore station releases during these cruises from both northern and southern transects were recovered in Area V. However, five recoveries were made in Area IV from bottles released during HC 31. Drift rates were generally low for all returns in all areas. Surface salinities at a number of offshore stations for HC 29 and 30, and one inshore station (G) for HC 30, were indicative of oceanic intrusion. Evidence of such intrusion during HC 31 was not as distinct, occurring at only one station. Figure 62 shows the position of the 20° C/150 m contour for 1 through 22 July 1966.

The topography of the 22° C isotherm at 100 m for 4 through 18 August 1966 (Leipper, 1970) and that of the 20° C isotherm at 150 m for 1 through 18 August (Figure 64) showed a different configuration of the Loop Current from that of June. From these contours it was apparent that the Loop Current penetrated even further into the Gulf than it did during June. A large-scale eddy, similar to that seen in August and September of 1965, appeared to be forming; but it had not detached.

Tampa wind vectors during HC 29 were toward the sector bounded by 40-130° for the seven day period following release (Figure 16). All Station A returns were to the south, in recovery Area I. Sixty-seven percent were within seven days of release. If a northerly current set existed in this area at the time, it may have been a weakened current dominated by the wind field. Ft. Myers wind data (Figure 17) displayed a similar wind field during the six day post-release period (90-150°), although resultant winds were usually 5 mph or less. This wind pattern would have opposed any initial northerly movement of drift bottles from Stations G, H, I, and J. During September 2 through 6 (HC 31) light winds generally oriented toward the coastline in the Ft. Myers area could have moved some of the drift bottles ashore from Stations H and I (Figures 18 and 19). Daily wind patterns were somewhat variable in both Tampa and Ft. Myers areas due to the dominance of convective storm activity.

Data from HC 32 (8 through 14 October 1966) (Figure 68) did not show a marked change in drift bottle trajectory from the three previous cruises. The percentage of bottles recovered from this cruise was abnormally low, however, compared with return percentages of all but one of the previous months (Table 2). The offshore position of the Loop Current, and the indication that it remained well offshore as it flowed through the Straits of Florida (Leipper, 1970, and Figures 64 and 67 for 1 through 18 August and 27 October through 13 November), could explain the low number of bottles from this cruise that were recovered in the lower Florida Keys. Salinity data for this cruise were also lower than for the previous cruises, another indication of the increased distance from the shelf of even Loop periphery waters. There was a marked decrease in recovery of bottles

released at inshore stations during this cruise. However, Bottle #6914, released at Station O, was recovered in the Outer Hebrides, Scotland.

Hurricane Inez passed to the south of the transect area (5 and 6 October) moving in a westerly direction. Tampa and Ft. Myers weather data indicated that westerly directed winds prevailed during this period.

Drift bottle returns from HC 33-36 (November 1966 through February 1967) (Figures 69 through 72) suggested that an eddy did break off and the Loop Current reformed into a pattern similar to February 1966, as shown by Leipper's (1970) surface topographies. There was little change in current trajectory throughout these cruises, indicating relative stability in the overall circulation pattern offshore. Bottle drift rates and percentages of returns increased for releases from these cruises. Bottle #9525, released at Station L during HC 36, was recovered in Area V (20.5 nmi/day). Bottle #9549, released at Station N during HC 36, was recovered at Heist, Belgium (27.1 nmi/day). Many offshore station salinities exceeded 36.00 °/oo during these cruises, indicating intrusion of oceanic waters.

Resultant wind data for Tampa and Ft. Myers during HC 34 indicated winds generally toward the sector bounded by 180-310° for the eight-day period during which bottles were released (Figures 20 and 21). A cold front passed on 11 December, and consequent wind shift resulted in a wind field directed to the south and southwest for a six-day period. This could have provided sufficient wind stress to move the drift bottles into offshore positions. Entrainment into an offshore current along the shelf could have been possible. Figure 67 shows the position of the Loop Current for late October-mid November, 1966. Wind patterns showed a good deal of variation during HC 36. Frontal passages on 7 and 21 February were associated with large directional changes in the resultant winds (Figures 22 through 25). It is not apparent from the wind rose analysis that there was strong enforcement to move bottles at all stations in an offshore direction.

There were recoveries in Areas III and IV from releases made during HC 37 (2 through 10 March 1967) (Figure 73) and recoveries in Area IV from releases made during HC 38 (3 through 9 April 1967) (Figure 74). Recoveries from inshore stations began to increase in Areas I and II, north of their release sites, particularly from releases made during HC 38. The only recovery in Area III from HC 37 releases was Bottle #9628, released at Station E and recovered at Tyndall Air Force Base (2.5 nmi/day). Bottle #9661, released at Station M and recovered at Palm Beach, Florida, had a drift rate of 20.1 nmi/day. Bottle #9621, released at Station E during HC 37, was recovered at Wrightsville Beach, North Carolina (10.0 nmi/day). Increased movement to the northern Gulf is thought to have been influenced by "spring intrusion" of the Loop Current.

Northward movement of drift bottles from Station H during HC 37 may have been associated with resultant wind vectors in a sector of 350-30° between 5 and 7 March (Ft. Myers winds, Figure 27). Sixty percent of the returns were on 7 March. A similar wind field existed for the Tampa area (Figure 26). This wind pattern, if present offshore, would have opposed the apparent southward movement of most drift bottles.

There were relatively few recoveries in Area V from releases during HC 38 and drift rate was notably decreased. Bottle #9859, released at Station M and recovered at Key West (Area V), had a drift rate of 3.5 nmi/day. Bottles recovered in Area II had a higher than usual rate of drift. Bottle #9874, released at Station O, was recovered at Cedar Key (3.6 nmi/day). Area I's first recovery, Bottle #9828, released at Station J, was recovered at Dunedin (3.1 nmi/day.). The rather strong demarcation of direction of flow may have indicated the beginning of Loop Current eddy

formation, which was not seen in 1966 until later in the year. The surface salinity and temperature relationship (36.59 °/oo, 23.0° C) at Station M, HC 38, showed actual Loop Current waters, while many other stations' salinity data suggested oceanic intrusion.

HC 39 (11 through 17 May 1967) (Figure 75) and HC 40 (2 through 18 June 1967) (Figure 76) recoveries showed an abrupt change in drift bottle trajectories. Returns from releases made during both cruises were evenly divided between Areas I and V with no returns from the northern and western Gulf of Mexico. Drift rates were not high for bottles released during these two cruises, except for Bottle #10012, released from Station M, HC 39, and recovered at Wrightsville Beach, North Carolina (29.8 nmi/day). Bottle #10005, released during HC 39 at Station L, was recovered at Marathon (7.8 nmi/day). Bottle #10183, released during HC 40 at Station N, was recovered at Miami (13.5 nmi/day). Salinity data observed during both cruises suggested oceanic intrusion. Salinities taken during HC 39 were higher than 36.50 °/oo in some instances, although coincident temperatures did not indicate Loop Current water.

Indication of wind influence was not clear for Station A returns (HC 40) in recovery Area I. The Tampa resultant wind on 4 June (date of earliest returns) was toward 120°; but the resultant wind speed was low. The onshore-offshore wind pattern was well established at this time of year, with the onshore component being generally more dominant in terms of wind speed. Comparison of resultant winds for Tampa and Ft. Myers (Figures 28 and 29) does show, however, that variation in this pattern existed along the coast. The four-day period between release and earliest return of Station I bottles (6 through 9 June) is defined by Ft. Myers data as having dominant onshore winds in the 60-120° sector (Figure 29). Winds during this period apparently did not enforce a northerly longshore current.

During June 1967, W. Nowlin, Jr. and associates conducted a cruise in the eastern Gulf to obtain detailed analyses of the Loop Current (Nowlin, et al., 1968). Their topography of the depth of the 22° C isotherm showed an entirely detached eddy west of the Loop Current. The abrupt change in our drift bottle trajectories during HC 39 (May 1967) and HC 40 (June 1967) was probably a result of this Loop Current configuration. Bottles were either transported south to the east coast (Area V) or affected by a northerly longshore current and transported inshore (Area I). No bottles were recovered in the western Gulf of Mexico.

Drift bottle data from HC 41 (1 through 7 July 1967) (Figure 78) and HC 42 (1 through 9 August 1967) (Figure 80) showed an increased recovery from the western Gulf of Mexico. It is possible that the eddy moved toward the western Gulf and disintegrated, while the Loop Current continued to penetrate into the Gulf. However, Figures 77 and 79 suggest that the eddy moved south and decayed.

Highest drift rate to Area IV for HC 41 was 2.4 nmi/day for both Bottle #10218, released at Station A, and Bottle #10353, released at Station O. Bottle #10260, released during this cruise at Station E, was recovered in Area V at Ft. Lauderdale (16.6 nmi/day). However, drift rates to Area V for HC 42 releases were lower, e.g., 5.1 nmi/day for Bottle #10477 released at Station K. Area IV recovery #10431, released at Station G, drifted 4.4 nmi/day. The most rapid drift rate to Area II was 7.5 nmi/day shown by Bottle #10523, released at Station P and recovered at Dunedin Beach, Florida. Bottle #10377, released at Station A, recovered at Tampa (Area I) had a drift rate of 9.3 nmi/day. Salinity and temperature data observed on offshore stations (E, L, M) for both cruises, indicated Loop Current water in the sampling area.

During HC 41, the earliest Station A returns in recovery Area I coincided with Tampa resultant winds between 50° and 80° (Figure 30), which could have enforced bottle drift directly inshore from the release point. Recovery data from Stations H and P indicated northerly movement of drift bottles. This was also evident for other HC 41 releases having longer recovery periods (Stations F, G, I, J, and N). It was possible that local winds during this period reinforced a northerly current or actually induced northerly surface drift. The onshore-offshore wind pattern was predominant, as in the previous month, but with an apparent shift toward a northerly sector of approximately 300-80° (Figures 30-33). Eighty-six percent of the recovery Area I drift returns from Station A (HC 42) were in a six-day period following release. This coincided with Tampa resultant wind vectors between 350-70° for 5 of the 6 days (Figures 34 and 35). Station J recovery data correlated well with resultant wind data from Tampa and Ft. Myers between 7 and 13 August (Figures 36 and 37). Tampa resultant winds blew in a northerly sector, 335-10°, with winds in the same direction (10°) for 6 of the 7 days. At Ft. Myers, wind shifted toward the north, becoming stronger by the end of the six-day period following release. All Station J drift bottles were found on 13 August, north of the release point. Key West wind data is displayed in Figure 38 to support the general indication that a consistent northerly directed wind field existed at this time, and may perhaps explain northerly movement of drift bottles from several other stations.

During HC 43 (31 August through 6 September 1967) (Figure 81) the bottom salinity and temperature data at Stations D, E, L, and M showed possible presence of Loop Current water. Drift bottle recovery distribution was much the same as the preceding cruise. However, the percentage of returns from Area V increased, and recoveries in Area I of bottles released at inshore stations decreased. Drift rates were higher (9.6 nmi/day) as shown by Bottle #10683, released at Station P, and recovered at Boynton Beach, Florida (Area V). Highest drift rate to Area IV (4.9 nmi/day) was shown by Bottle #10548, released at Station B. There were no Loop Current isothermal data available for comparison after August 1967; however, from drift bottle recovery distribution alone it was possible to infer the Loop Current's general configuration during the remainder of the Hourglass cruises. Fall drift bottle return patterns were similar to those of 1965 and 1966, with major differences being in total returns per area, those from Area V being higher in 1967 than in 1965 and 1966.

There was another change in the drift bottle return pattern for releases made during HC 44 (5 through 13 October 1967) (Figure 82). All returns except four were from Area V. These four returns were released at Station H and recovered directly inshore (Area I). A questionably high drift rate was calculated from HC 44 data. Bottle #10706, released at Station B, was recovered at Stuart, Florida (69.2 nmi/day). Return data from releases made in October 1965 and 1966 did not suggest strong wind influence, but they did demonstrate the effect of "fall spreading" seen as reduced drift rates to Area V and continued recoveries in the western Gulf of Mexico.

Data from releases made during the final Hourglass cruise, HC 45 (2 through 16 November 1967) (Figure 83) showed drift bottle trajectories similar to those of HC 43. A strong demarcation in direction of flow between the northern and southern transects was again present. This appeared to be the pattern when the Loop Current had penetrated well into the Gulf of Mexico. Drift bottles released at intermediate and lower transect stations had a southerly or southwesterly trajectory and were all recovered in Area V. There were five returns from Area IV and two from Mexico, all released on the northern transect. We can compare this month's return pattern with those of 1965 and 1966 to demonstrate that November 1967 and November 1965 had similar recovery distributions. In 1965 there was necking of the main current, while in 1966 the eddy had detached from the main current (Leipper, 1970) and seemed not immediately to affect circulation in the Hourglass area. Thus, we can suggest that in November 1967 the Loop Current was in a configuration comparable to that contoured by Leipper for November 1965.

Wind roses showed indication of wind flow in a south-to-southwest sector for most of a 10-day period beginning 2 November (Figures 39, 40 and 41). There were relatively few returns from Stations A through H, all occurring in recovery Area IV or V. Winds for the period following Station I through P releases were not as consistent. Daily wind patterns shifted considerably between 14 and 23 November, according to Tampa and Ft. Myers resultant winds (Figures 42 and 43). Wind data for a shorter time period, e.g., 16 through 20 November (Figures 42 and 43) indicated that winds could have moved bottles offshore. Wind influence to the south of the transect area (Figure 44, Key West) and possible entrainment into a south flowing current are two conditions which may account for subsequent drift bottle movement.

CONCLUSIONS

LOOP CURRENT

Interpretation of drift bottle data supplemented by hydrographic sampling and wind analysis has provided a description of surface circulation in the Gulf of Mexico, particularly over the West Florida Shelf during 1965 to 1967. Patterns of drift bottle returns compared with topographies of the 22° C or 20° C isotherms indicated the sequence of Loop Current development: intrusion ("spring intrusion"), expansion ("fall spreading"), and withdrawal of this current in the Gulf of Mexico during 1965 to 1967. Since these studies were completed, however, it has become apparent that the Loop Current has extreme short term variability and is not predictable on a seasonal basis. For example, "spring intrusion" in 1975, 1976, and 1977 occurred in February or March and penetrated farther into the northern Gulf than previously documented. Recent monitoring of the Loop Current by satellite has allowed better confirmation of both seasonal and short term variability in its position (SUSIO, 1975).

Data obtained from the National Environmental Satellite Service, Miami, Florida, on the positions of the Loop Current during the first three months of 1977 definitely indicated the occurrence of significant short period (weekly) variation and changes in seasonal patterns (Baig, 1977). Analyses of drift trajectories based upon a knowledge of the assumed location of this current, as determined from discrete sample cruises (1965-1967), should therefore be considered only as a general interpolation. Yet it is important to realize that a sequential characterization of intrusion, spreading, eddy formation, and decay is still valid even though its magnitude and seasonality may vary.

A study of the Loop Current by other investigators, during the period of the Hourglass cruises, revealed specific seasonal trends in the pattern of movement. The admission was made, however, that short term variations (days or weeks) may have existed which could not be validly confirmed from the sampling and analysis methods being used (Gaul, 1967). One example of seasonality ("fall spreading") as indicated by Loop Current isotherms and drift bottle trajectories was derived from HC 19 (September 1965). By September a detached or semi-detached eddy was forming off the northern edge of the main current. This large scale anticyclonic eddy usually drifted toward the western Gulf when isolated from the main current (Jones et al., 1973; Ichiye et al., 1973). The deep penetration and spreading of this warm oceanic water into the Gulf as shown in the September topographies agreed well with Hourglass data because the fall drift bottle return data showed scattering to the western Gulf. However, the specific mechanism of transport *in* the western Gulf is not understood. The presence of a large scale eddy in the northern Gulf could have accounted for lower drift rates of bottles recovered from the western areas because it could have inhibited an object from drifting along an uninterrupted path from east to west.

Another contributing factor to the lower drift rates and the number of bottles moving west was possible entrainment in small cyclonic eddies. Maul et al. (1974) stated that the smaller eddies (10-30 km diameter) associated with the main Loop Current were decidedly cyclonic. These cyclonic eddies could have occurred on the periphery of either the main Loop Current or along the edge of a detached anticyclonic eddy. A cyclonic eddy may have provided a transport mechanism from the Hourglass sampling area toward the western Gulf. Its vorticity could have trapped the bottles until they were expelled by local wind stress or some other physical factor. Cyclonic eddies may also have accounted for the low percentage of recoveries in Areas II and III, if, or when, entrapment in these eddies prevented bottles from being beachcast along these coastlines. Eddies, large and small scale, appeared to affect drift bottle trajectories, generally dependent upon point of release (upper or lower transect, inshore or offshore stations) and the latitude of intrusion of the Loop Current into the Gulf.

Following all cruises, recoveries were also made on the east coast of Florida and Florida Keys (Area V). West Florida Shelf water that is entrained toward the southerly moving Loop Current was documented as normally entering the Straits of Florida at a point west of the Dry Tortugas (Koczy et al., 1960). Hourglass return data show that bottles released on the shelf between Tampa Bay and Ft. Myers were also entrained into the cyclonic edge of the southerly moving Loop Current and held there by what Maul (1975) defines as "edge effect." Once into the Straits of Florida these bottles were rapidly transported by the Florida Current and Gulf Stream and deposited along the Florida east coast and Keys.

Almost all returns were from Area V when the Loop Current was in its "winter configuration." This suggested that the well-defined structure of the current at lower latitudes transported bottles more rapidly than at other times. It is speculated that winds could have transported drift bottles to Loop Current waters where they were entrained. During periods of intrusion, spreading and eddy formation, when the degree of penetration and meanderings of the Current were greater, the drift rate of bottles decreased. Another nearshore influence was the presence of a northerly longshore current during spring and summer, which appeared to influence drift bottle movement in Area I and transport to Areas II and III. This can be seen in HC 28 drift bottle trajectories and Leipper's (1970), and SUSIO's (1975) topographies for June 1966. Wind influence was principally detected in the number of bottles recovered in Area I directly inshore from their release points. From this data, the inference was made that occasionally winds influenced drift bottle movement to an offshore transport mechanism.

WIND INFLUENCE

There was good indication that wind patterns influenced drift bottle movement in 6 of the 10 randomly selected releases from Stations A, H, I, and P. These were HC 20, 25, 27, 29, 41, and 42. In other wind analyses, the wind patterns either opposed the apparent drift of bottles indicated by landings (37, 40), or were too variable for clear interpretation (21, 23, 31, 36). For HC 20, 25, and 41, it was necessary to rely largely on chronological comparisons of drift bottle release and recovery dates with the resultant wind vectors in order to confirm a possible relationship of wind factor to drift movement. The dominating wind pattern was very apparent for the entire period analyzed for HC 27, 29, and 42.

Drift bottle releases from two cruises, 34 and 45, that had no recovery Area I returns appeared to have been definitely influenced by wind conditions. Tampa and Ft. Myers wind data suggested that winds for the eight day release period of HC 34 would have favored offshore movement of surface waters. Associated wind data indicated continued south-to-southwest directed winds

following this period. Wind orientation for Station A through H releases of HC 45 presented good evidencesthat wind was a mechanism for initial offshore placement of drift bottles. Wind rose data for later releases of this cruise (Stations I through P) were not as definitive, but when analyzed in conjunction with Key West, Florida, wind data did reveal a possible mechanism for initial transport. Frontal passages produced significant variation in wind direction during HC 36; no distinct pattern of possible wind influence was apparent from the wind roses.

Resultant wind roses have helped to confirm the dominating influence of wind upon surface drift for certain short period recoveries, or occasionally its opposition to the apparent bottle drift trajectories. In the latter, local tidal currents or currents from other source areas could have been the dominating forces. Wind analyses were supportive for some of the cruises which had no returns in recovery Area I. Initial movement of drift bottles could have been wind affected. However, explanation of subsequent movement by wind or major current features would involve finer resolution of wind and surface current data from offshore areas along the West Florida Shelf. Use of the two "coastal" weather stations, Tampa and Ft. Myers, for each wind rose analysis allowed some confidence in judging the amount of variability in the wind field throughout the Hourglass transect area.

In summary, the Loop Current and its eddy structures are the main circulation features of the eastern Gulf of Mexico open waters. These structures significantly influence circulation over the West Florida Shelf. A sequential pattern of Loop Current development (intrusion, spreading, eddy formation, decay) has been well documented by hydrographic and satellite data. However, the inferred seasonality as based on 1965-1967 data can no longer be considered typical. We cannot say that in February the Loop Current will be situated at a specific location or that it will be in its lower configuration. More recently, short term variability of the Loop Current's position and direction has been documented. Therefore, the use of monthly isothermal topographies should be viewed with caution, although they can readily be used for major developmental trends. Winds appear to be capable of modifying nearshore surface circulation on a local scale, or serving as a driving force for mass transport of surface waters into adjacent areas. The direction and magnitude of these features is generally dependent on seasonal weather patterns.

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FIGURES 3 - 44

WIND ROSE DIAGRAMS

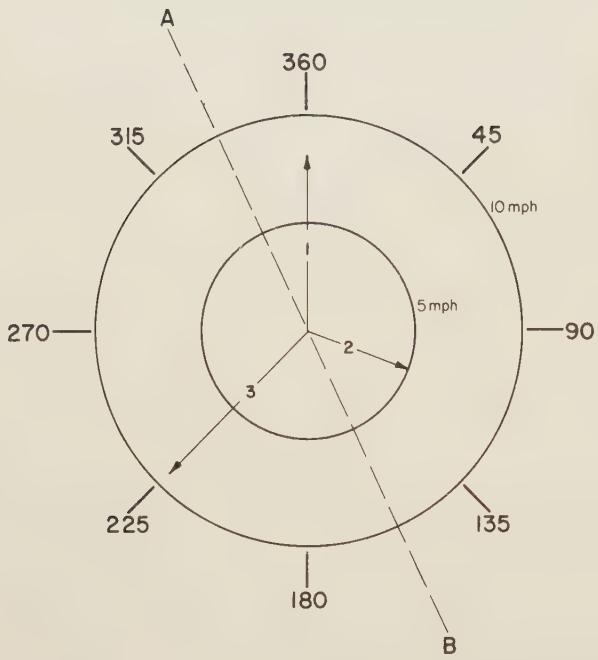

Figure 3. General wind rose diagram. Line AB represents orientation of local coast (St. Petersburg to Naples), 155-335°. Numbers on resultant wind vectors represent consecutive days for the period indicated. The vectors indicate direction toward which wind was blowing.

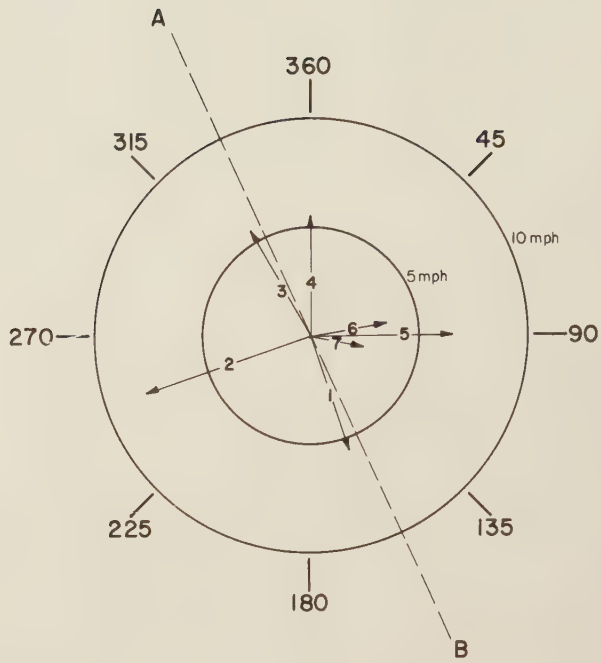

Figure 5. HC 20, Ft. Myers, Florida: 10/4/65 - 10/10/65.

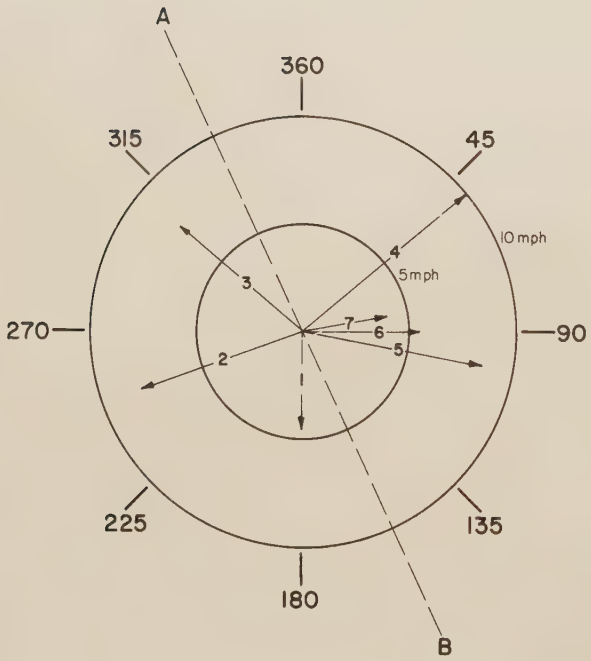

Figure 4. HC 20, Tampa, Florida: 10/4/65 - 10/10/65.

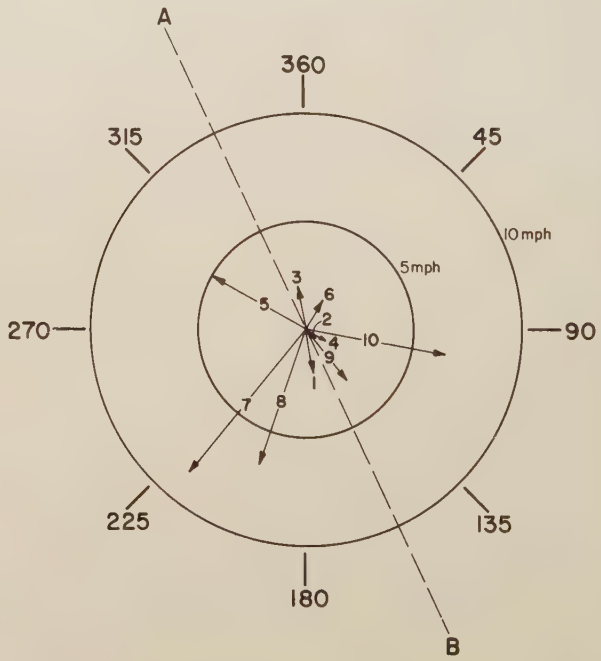

Figure 6. HC 21, Tampa, Florida: 11/8/65 - 11/17/65.

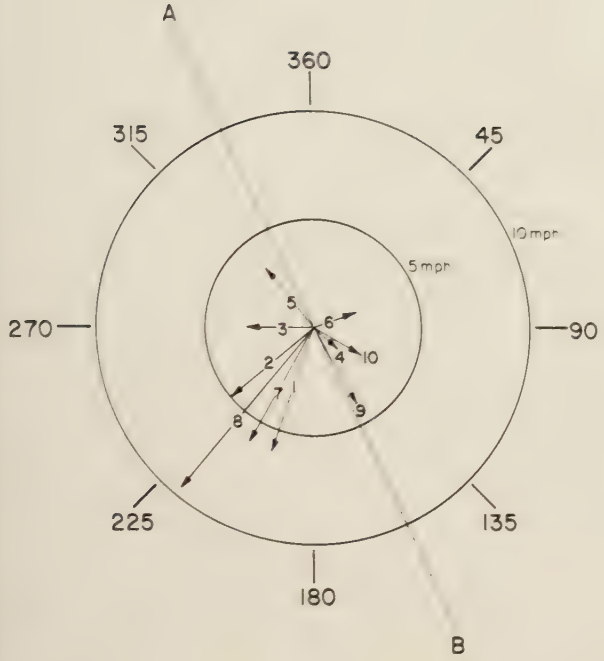

Figure 7. HC 21, Ft. Myers, Florida: 11/8/65 - 11/17/65.

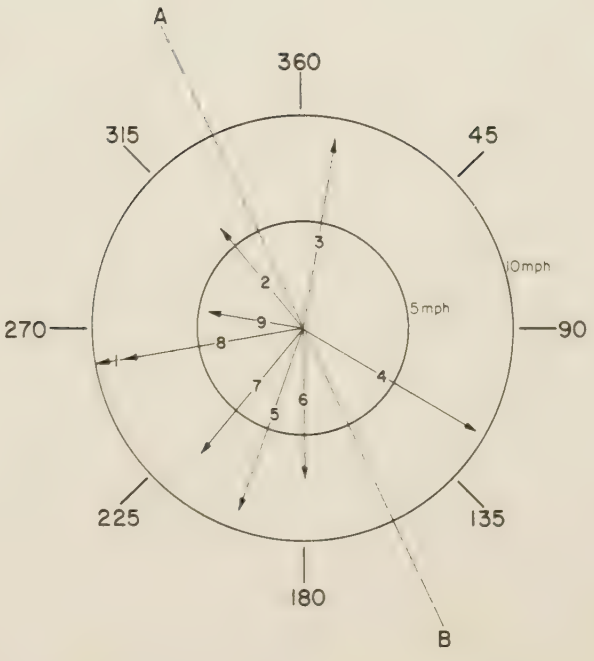

Figure 9. HC 23, Ft. Myers, Florida: 1/13/66 - 1/21/66.

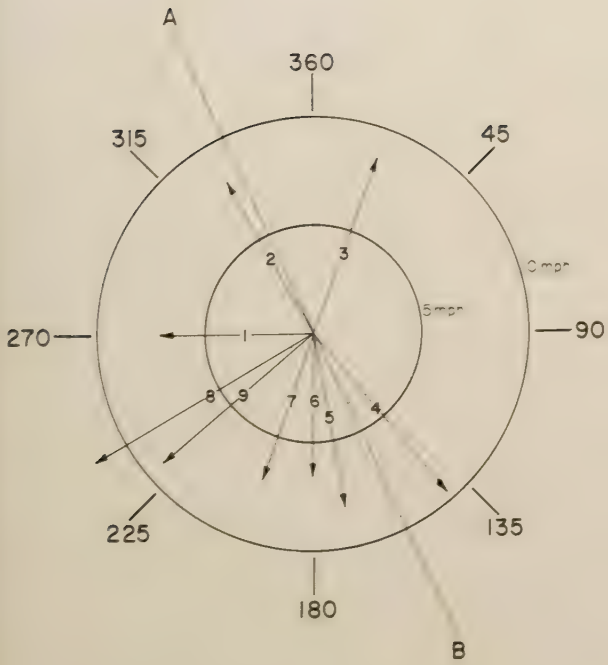

Figure 8. HC 23, Tampa, Florida: 1/13/66 - 1/21/66.

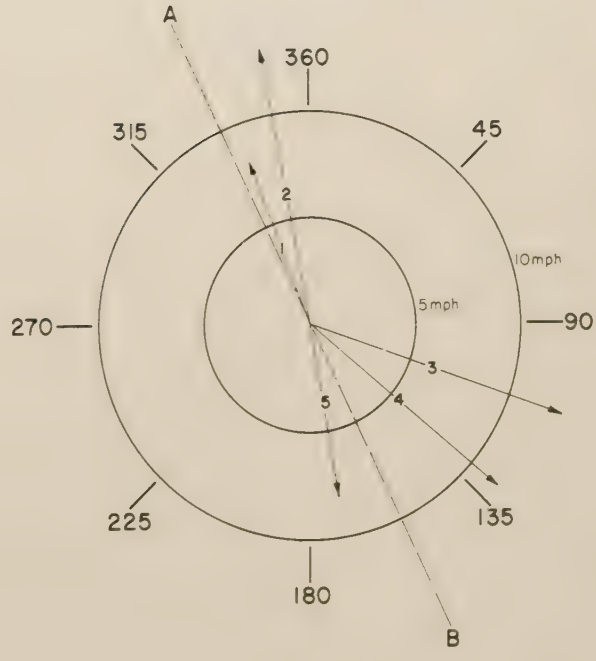

Figure 10. HC 25, Tampa, Florida: 3/3/66 - 3/7/66.

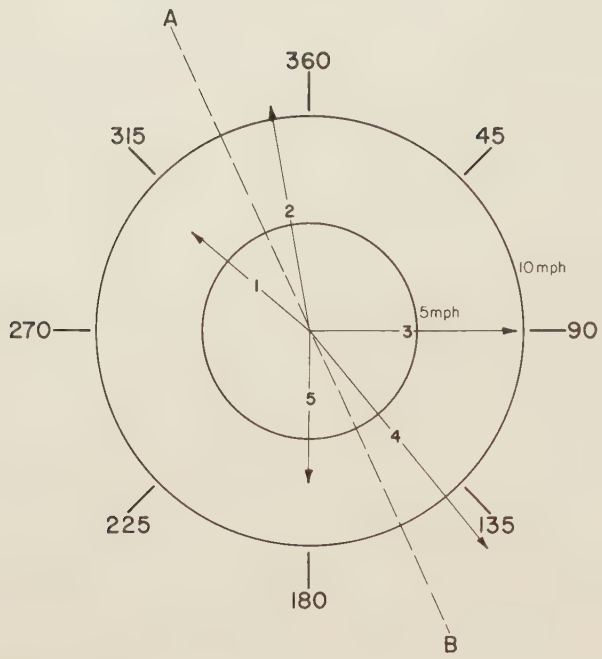

Figure 11. HC 25, Ft. Myers, Florida: 3/3/66 - 3/7/66.

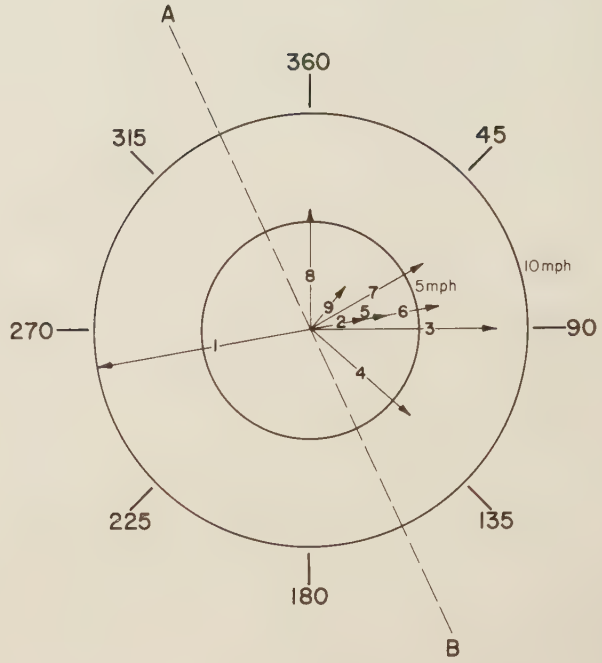

Figure 13. HC 27, Ft. Myers, Florida: 5/12/66 - 5/20/66 (Station P).

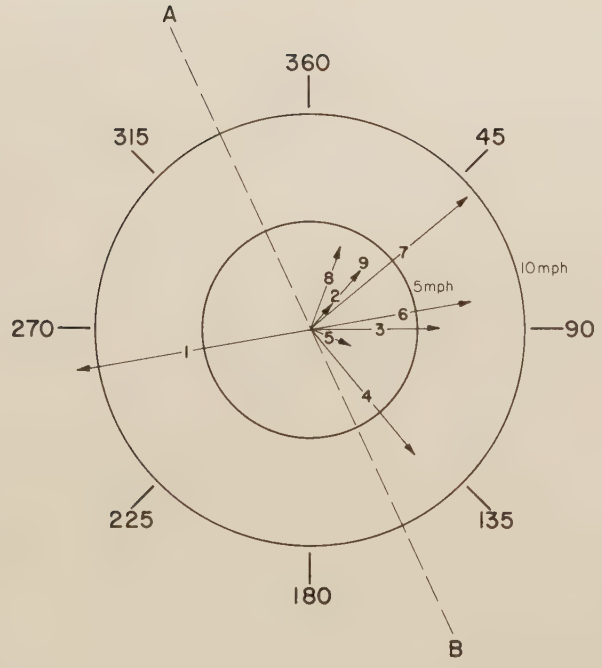

Figure 12. HC 27, Tampa, Florida: 5/12/66 - 5/20/66 (Station P).

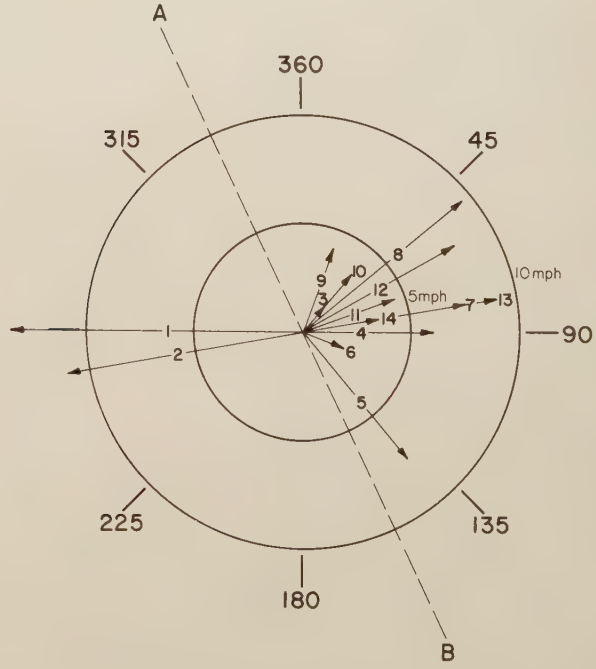

Figure 14. HC 27, Tampa, Florida: 5/11/66 - 5/24/66 (Stations J, N, O).

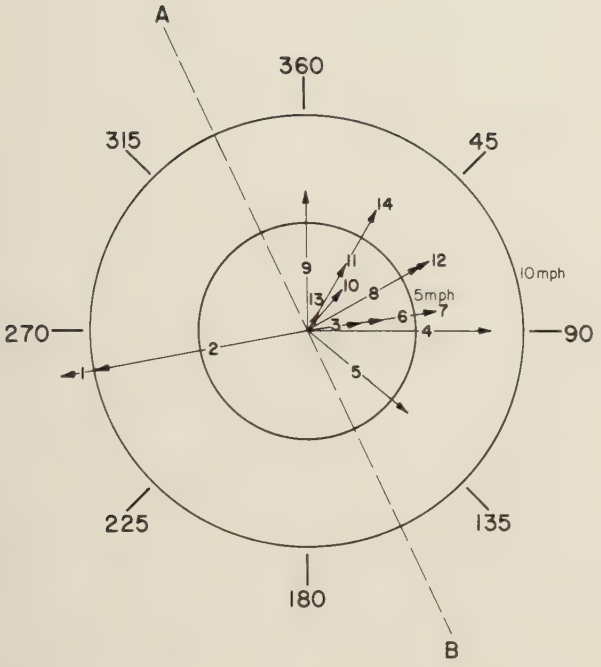

Figure 15. HC 27, Ft. Myers, Florida: 5/11/66 - 5/24/66 (Stations J, N, 0).

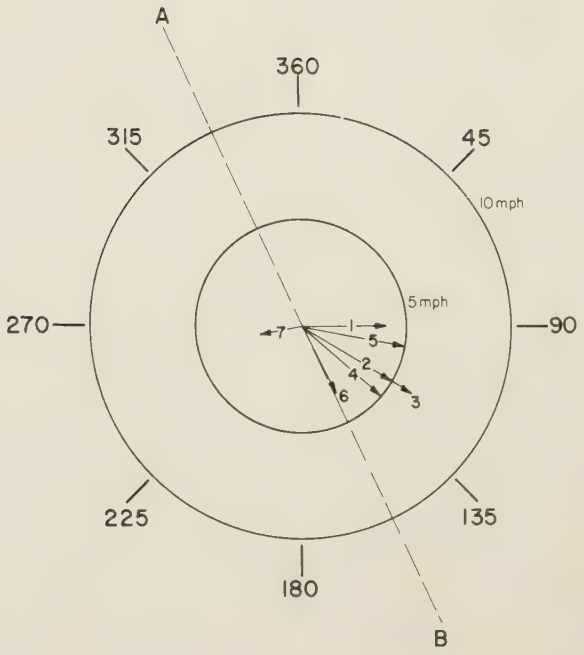

Figure 17. HC 29, Ft. Myers, Florida: 7/2/66 - 7/8/66.

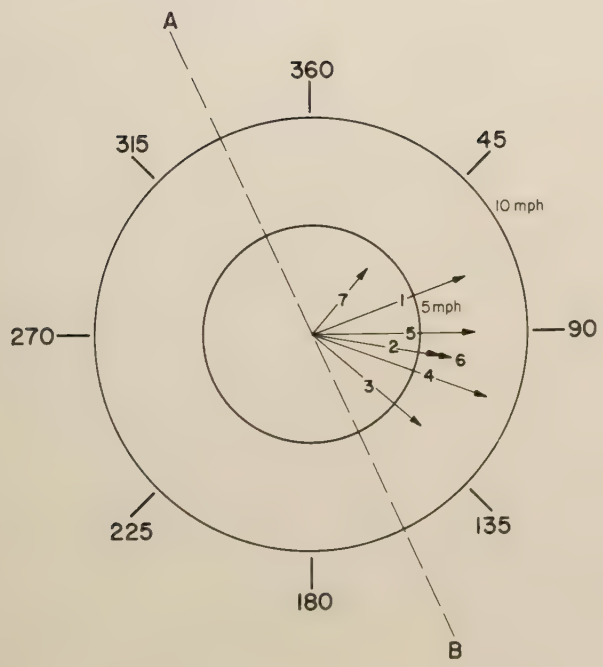

Figure 16. HC 29, Tampa, Florida: 7/2/66 - 7/8/66.

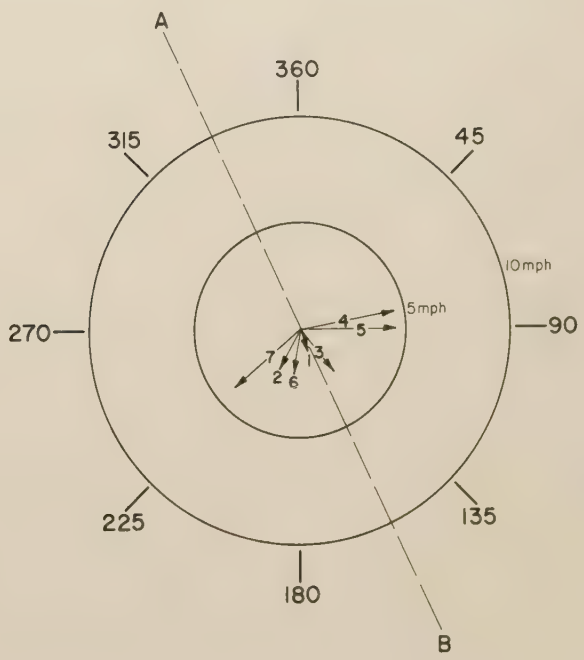

Figure 18. HC 31, Tampa, Florida: 9/2/66 - 9/8/66.

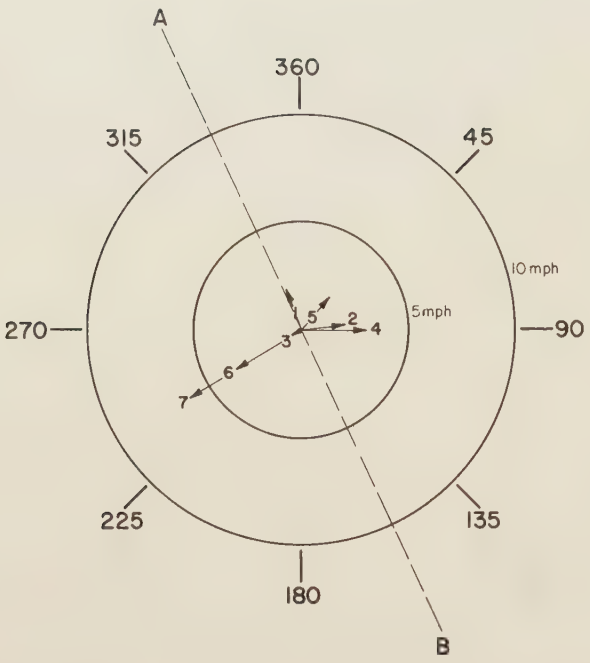

Figure 19. HC 31, Ft. Myers, Florida: 9/2/66 - 9/8/66.

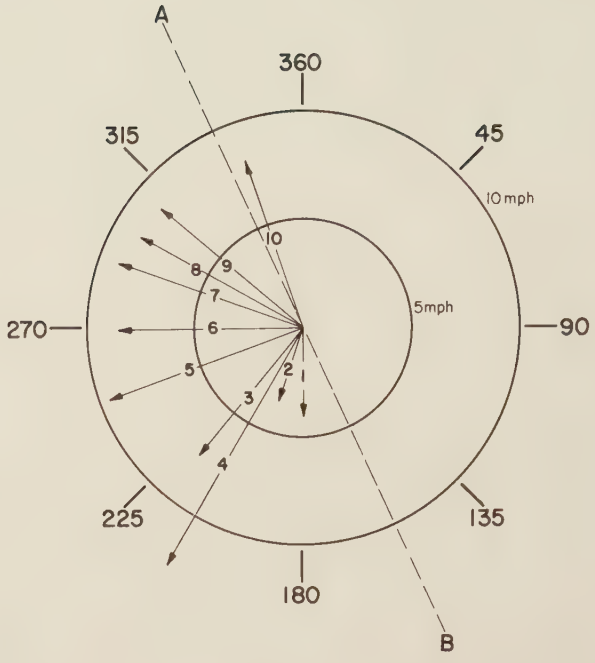

Figure 21. HC 34, Ft. Myers, Florida: 12/1/66 12/10/66.

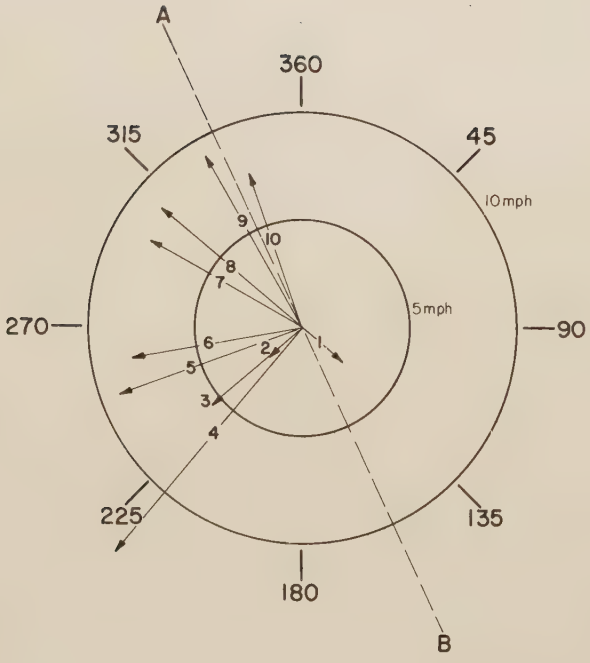

Figure 20. HC 34, Tampa, Florida: 12/1/66 - 12/10/66.

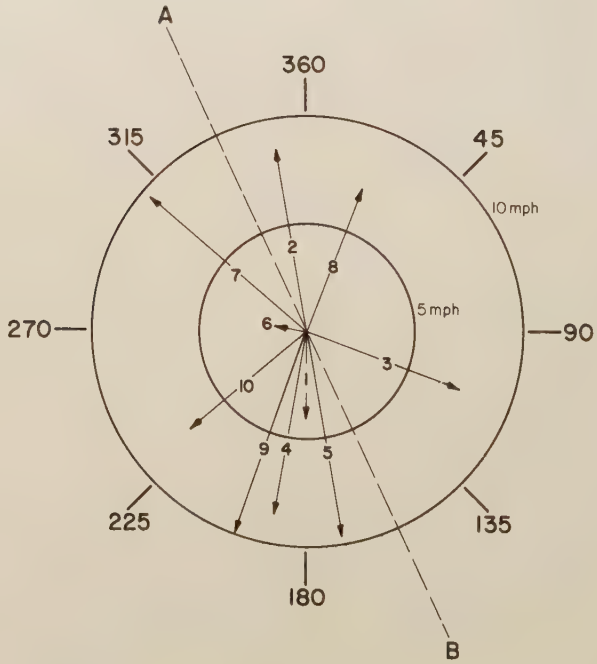

Figure 22. HC 36, Tampa, Florida: 2/5/67 - 2/14/67.

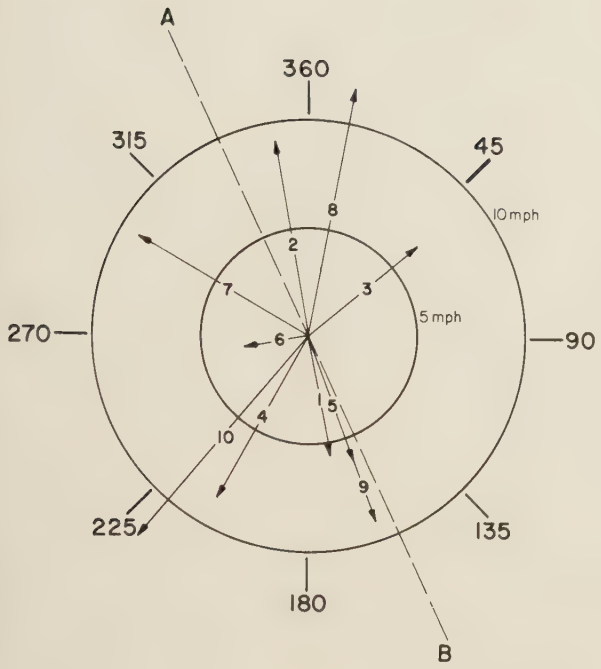

Figure 23. HC 36, Ft. Myers, Florida: 2/5/67 - 2/14/67.

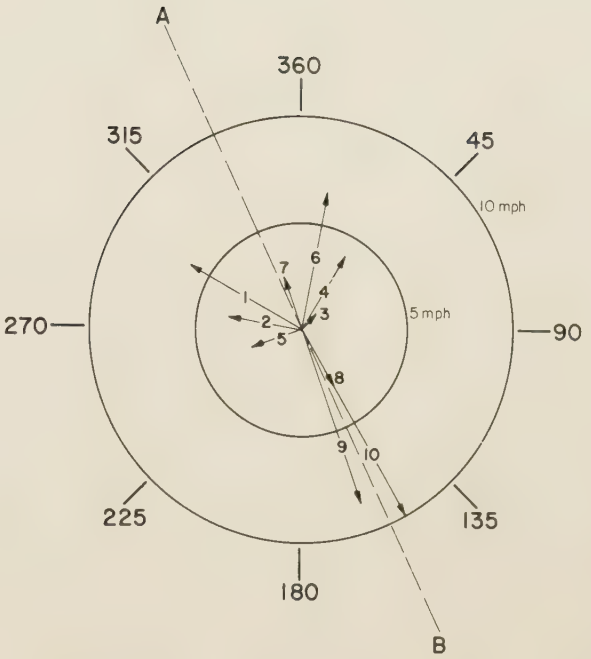

Figure 25. HC 36, Ft. Myers, Florida: 2/15/67 - 2/24/67.

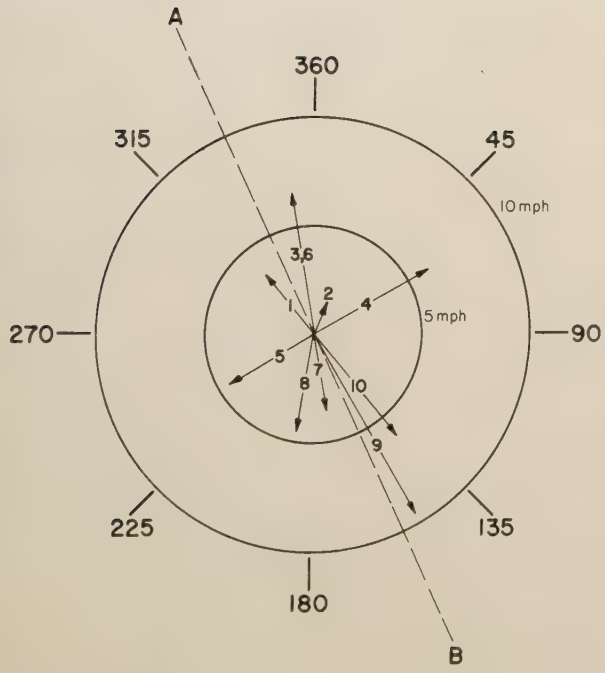

Figure 24. HC 36, Tampa, Florida: 2/15/67 - 2/24/67.

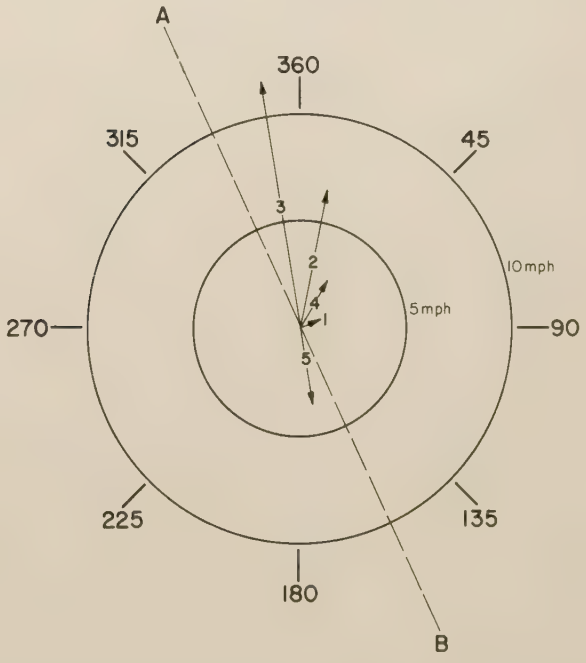

Figure 26. HC 37, Tampa, Florida: 3/4/67 - 3/8/67.

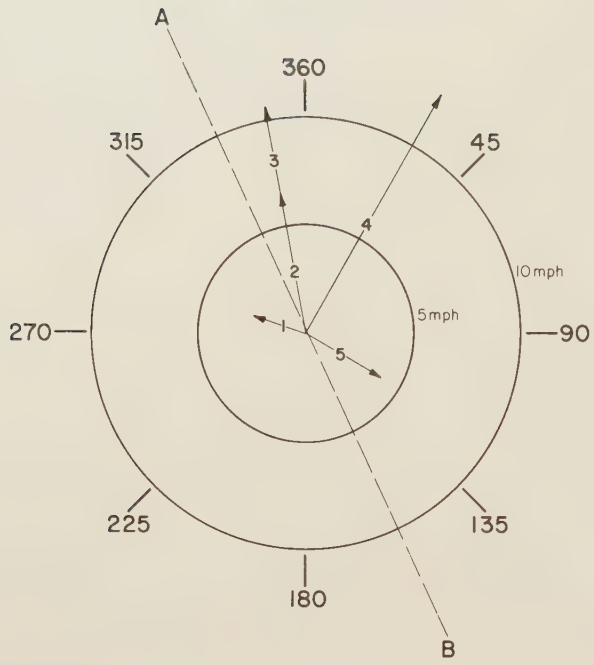

Figure 27. HC 37, Ft. Myers, Florida: 3/4/67 - 3/8/67.

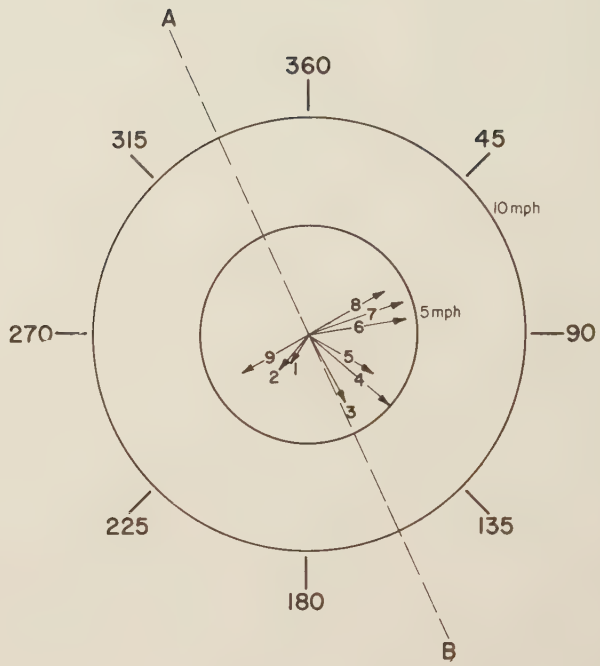

Figure 29. HC 40, Ft. Myers, Florida: 6/2/67-6/10/67.

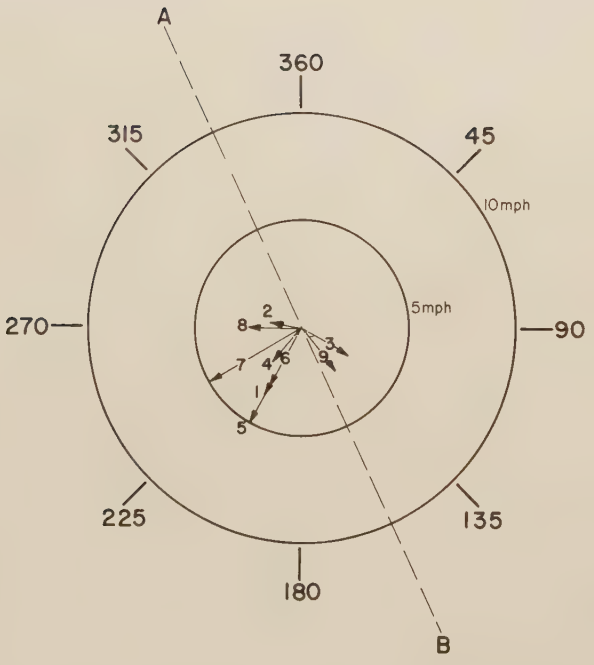

Figure 28. HC 40, Tampa, Florida: 6/2/67 - 6/10/67.

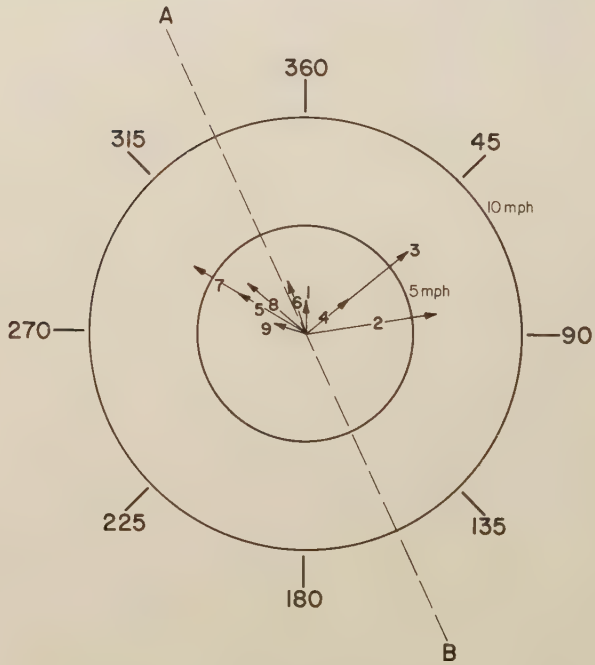

Figure 30. HC 41, Tampa, Florida: 7/1/67 - 7/9/67.

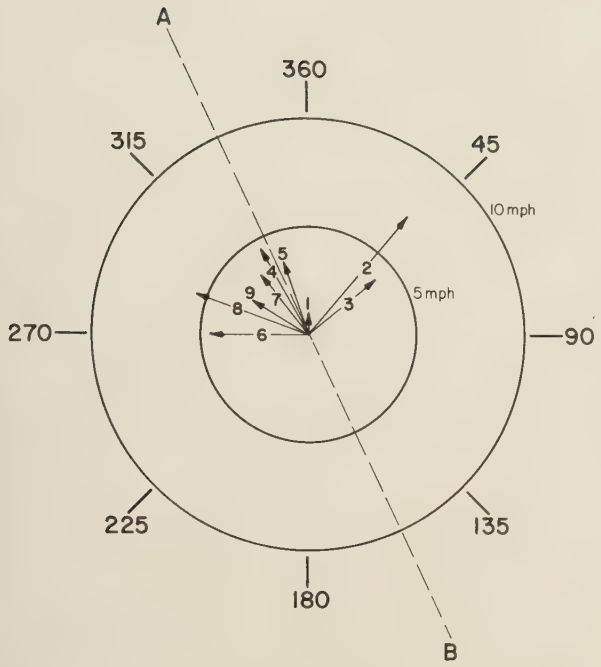

Figure 31. HC 41, Ft. Myers, Florida: 7/1/67 - 7/9/67.

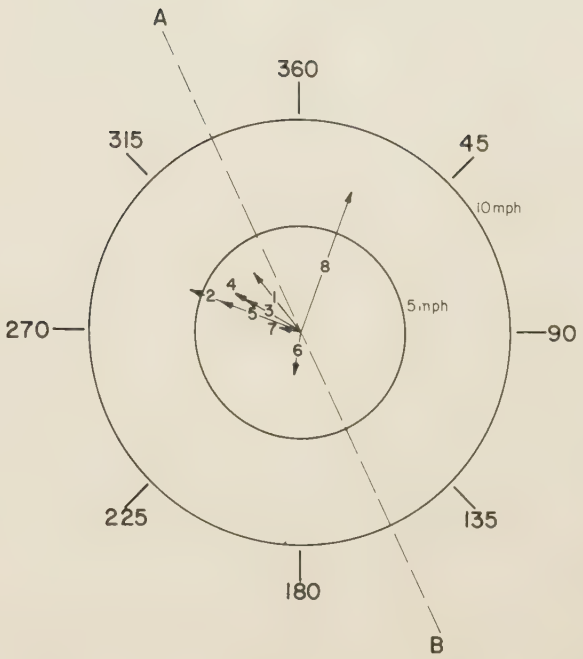

Figure 33. HC 41, Ft. Myers, Florida: 7/7/67 - 7/14/67.

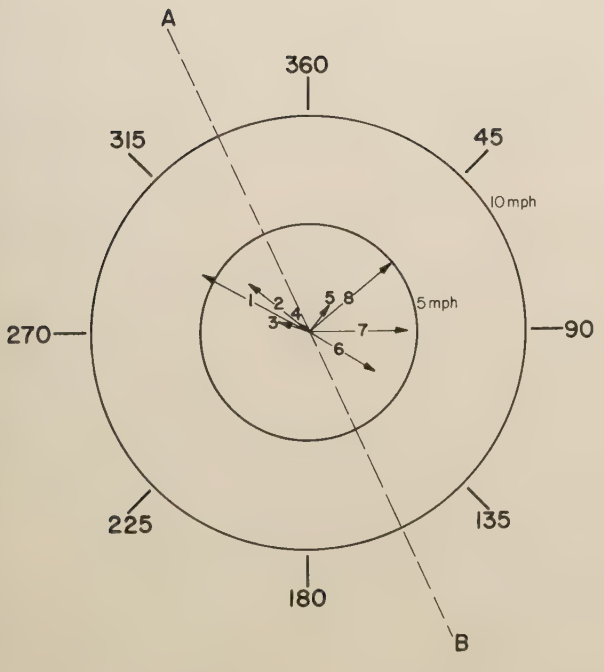

Figure 32. HC 41, Tampa, Florida: 7/7/67 - 7/14/67.

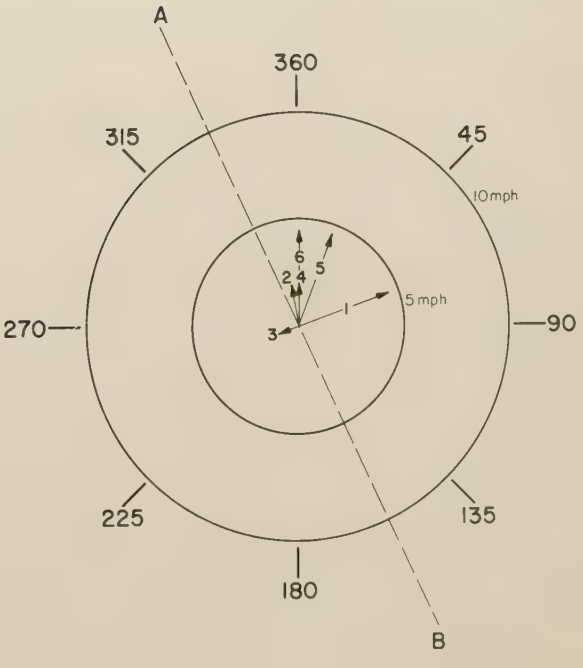

Figure 34. HC 42, Tampa, Florida: 8/1/67 - 8/6/67 (Station A).

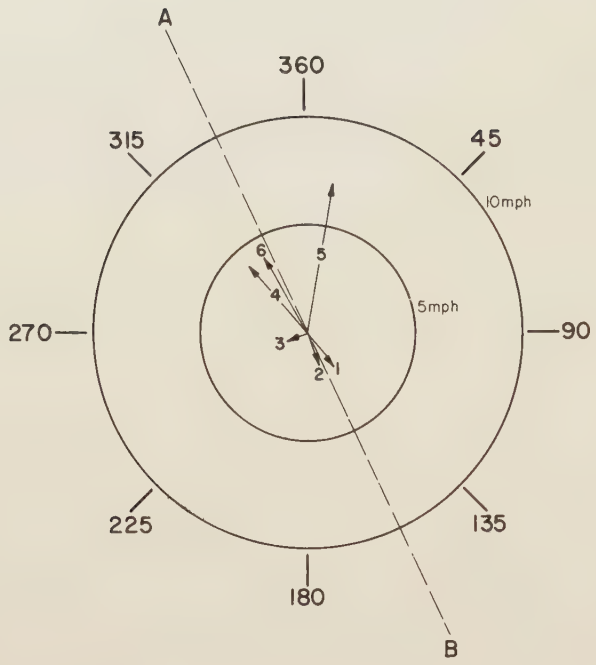

Figure 35. HC 42, Ft. Myers, Florida: 8/1/67 - 8/6/67 (Station H).

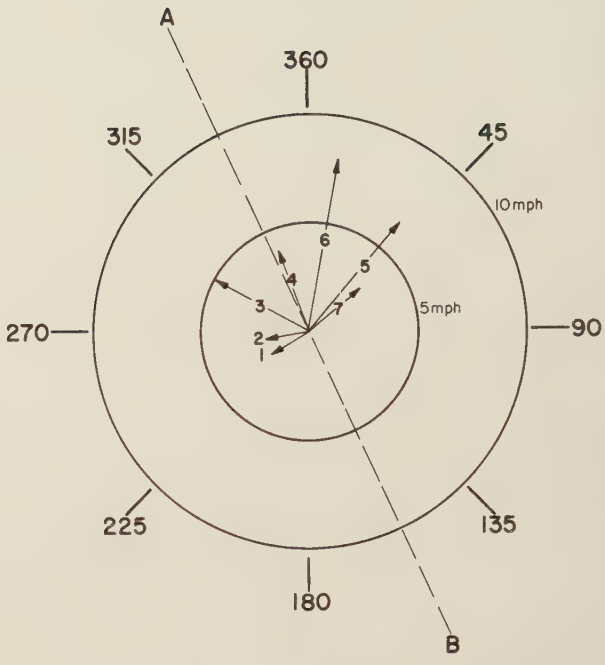

Figure 37. HC 42, Ft. Myers, Florida: 8/7/67 - 8/13/67 (Station J).

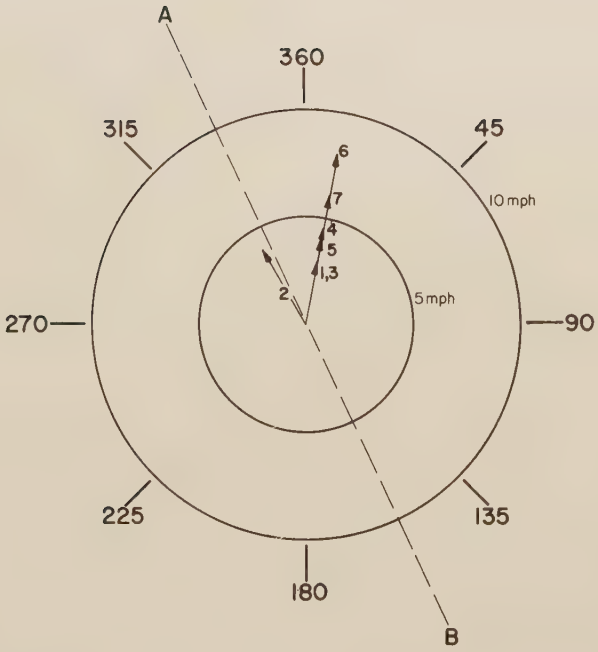

Figure 36. HC 42, Tampa, Florida: 8/7/67 - 8/13/67 (Station J).

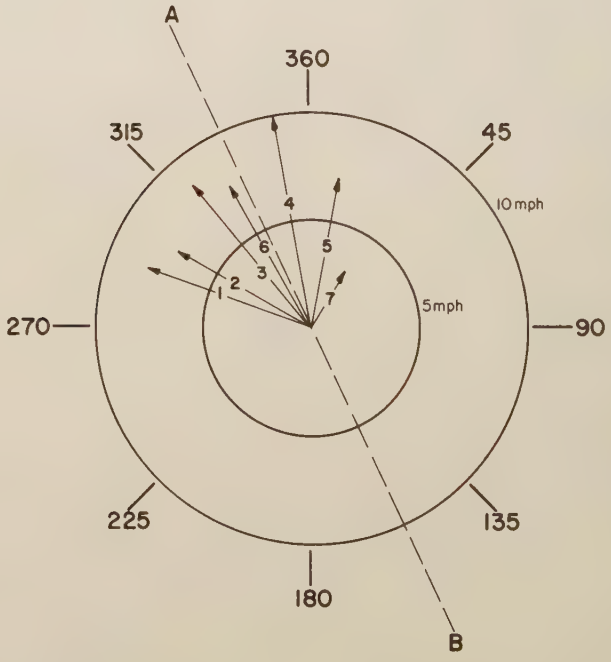

Figure 38. HC 42, Key West, Florida: 8/7/67 - 8/13/67.

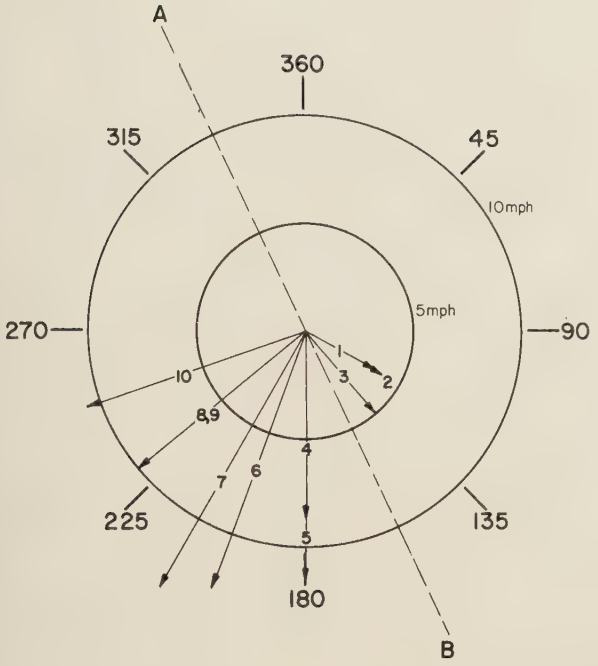

Figure 39. HC 45, Tampa, Florida: 11/2/67 - 11/11/67 (Stations A-H).

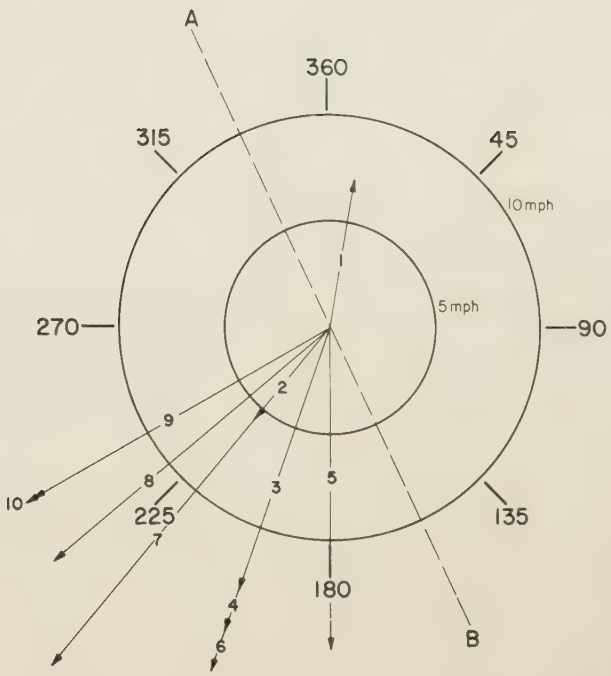

Figure 41. HC 45, Key West, Florida: 11/2/67 - 11/11/67 (Stations A-H).

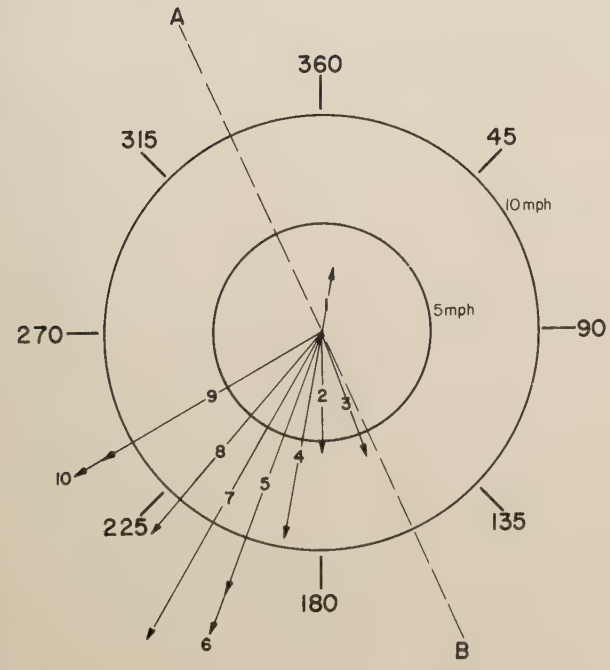

Figure 40. HC 45, Ft. Myers, Florida: 11/2/67 - 11/11/67 (Stations A-H).

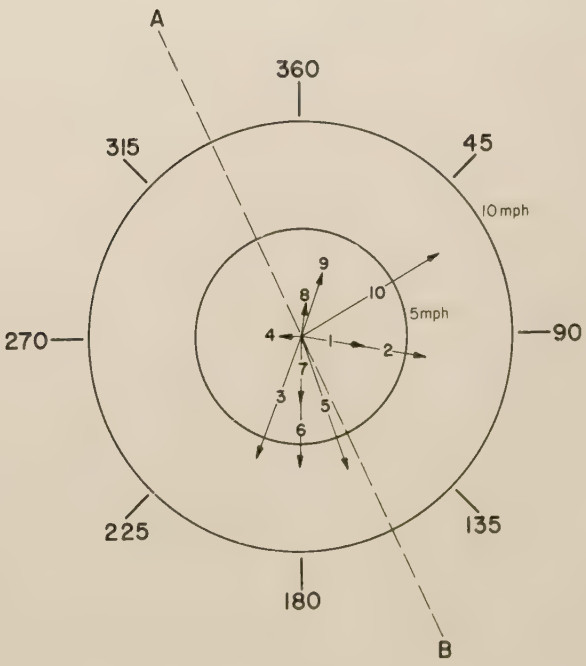

Figure 42. HC 45, Tampa, Florida: 11/14/67 - 11/23/67 (Stations I-P).

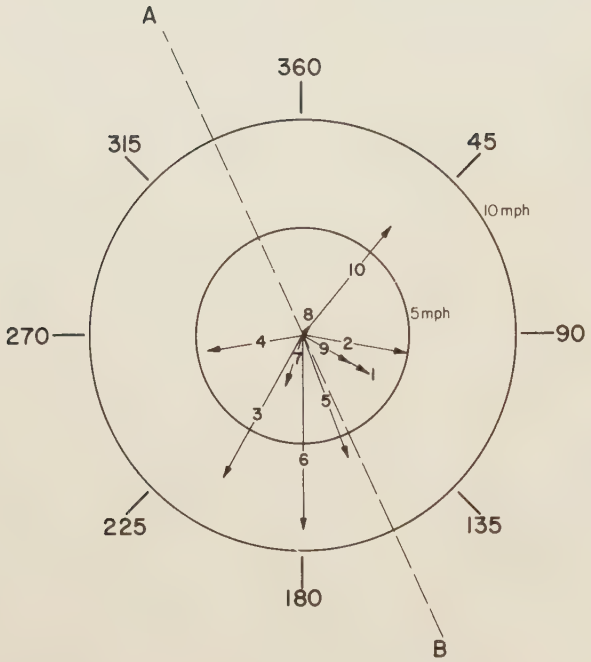

Figure 43. HC 45, Ft. Myers, Florida: 11/14/67 - 11/23/67 (Stations I-P).

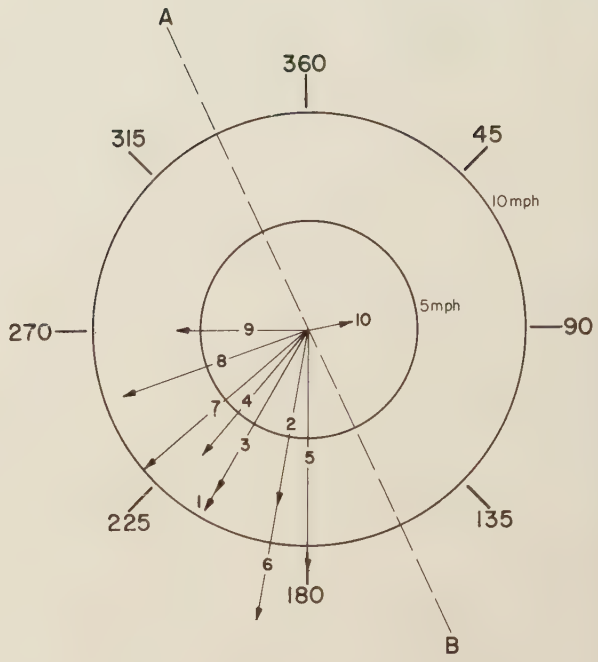

Figure 44. HC 45, Key West, Florida: 11/14/67 - 11/23/67 (Stations I-P).

FIGURES 45 - 83

CHARTS OF THE GULF OF MEXICO SHOWING

DRIFT BOTTLE RELEASE AND RECOVERY

Figure 45. Drift bottle recovery areas.

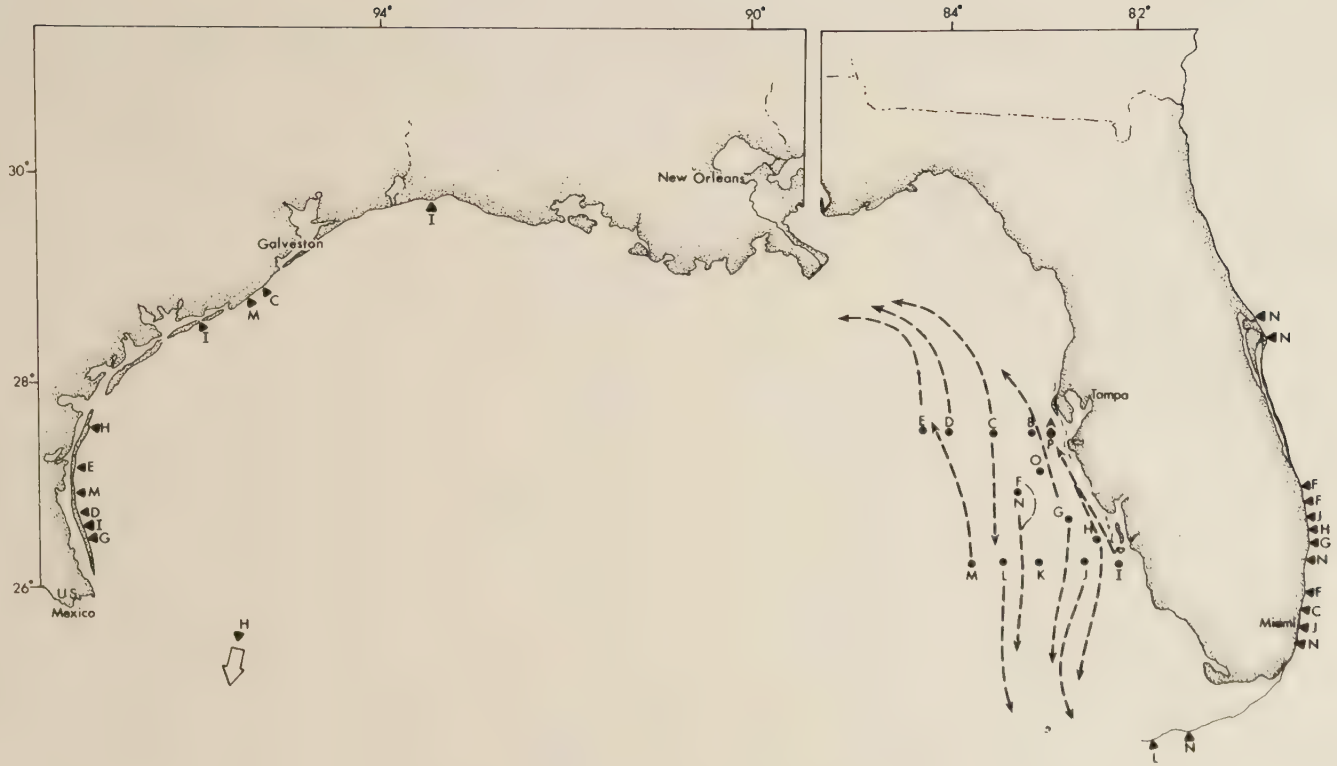

Figure 46. HC 18, 3-8 August, 1965.

Figure 47. HC 19, 30 August - 5 September, 1965.

Figure 48. Loop Current position indicated by the 20° C isotherm surface at the 150 m contour level; 3-17 July 1965 (SUSIO, 1975).

Figure 49. Loop Current position indicated by the 20° C isotherm surface at the 150 m contour level; 13-20 September 1965 (SUSIO, 1975).

Figure 50. HC 20, 4-14 October 1965.

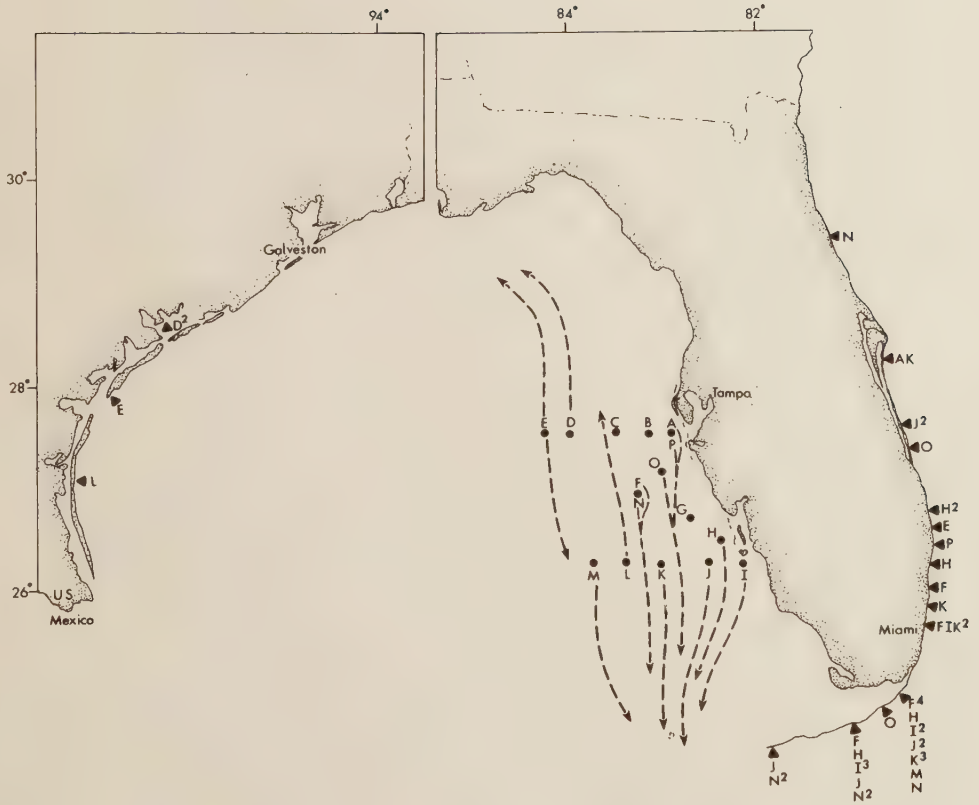

Figure 51. HC 21, 8-14 November 1965.

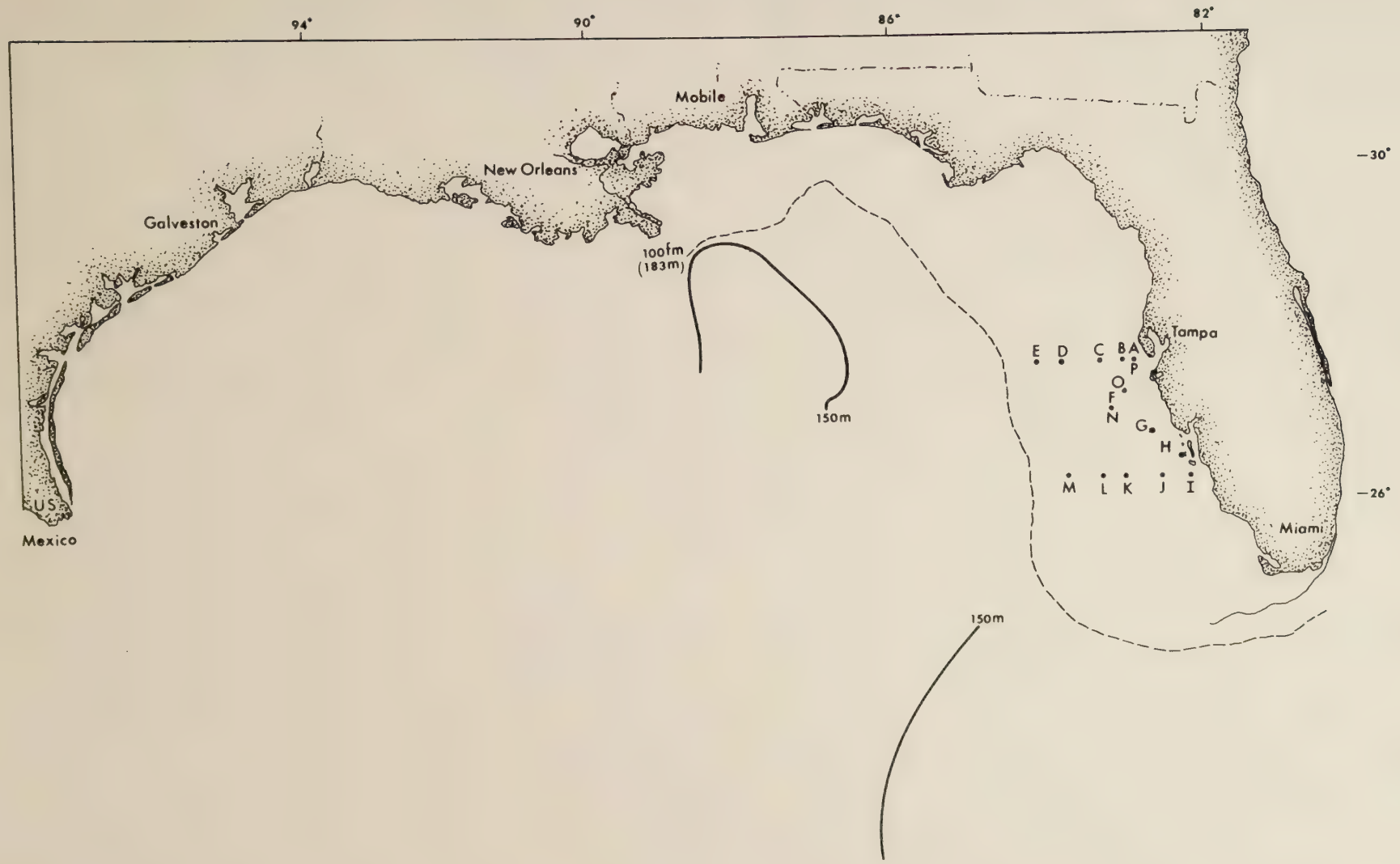

Figure 52. Loop Current position indicated by the 20° C isotherm surface at the 150 m contour level; 26 November - 5 December 1965 (SUSIO, 1975).

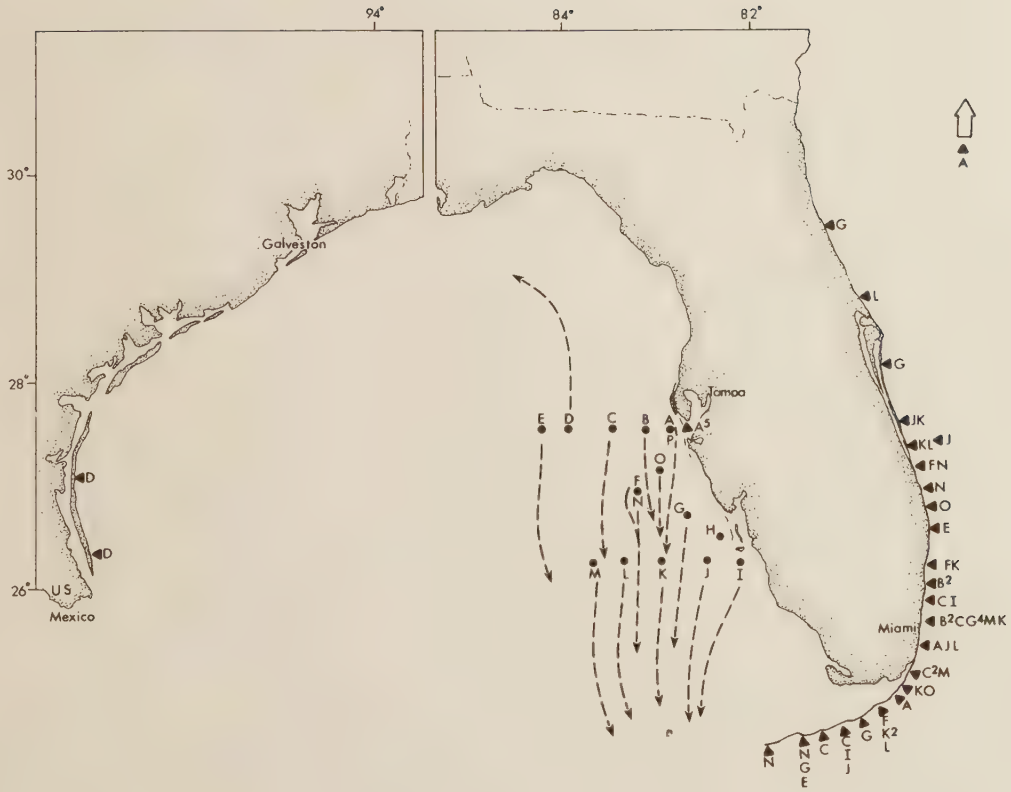

Figure 53. HC 22, 3-14 December 1965.

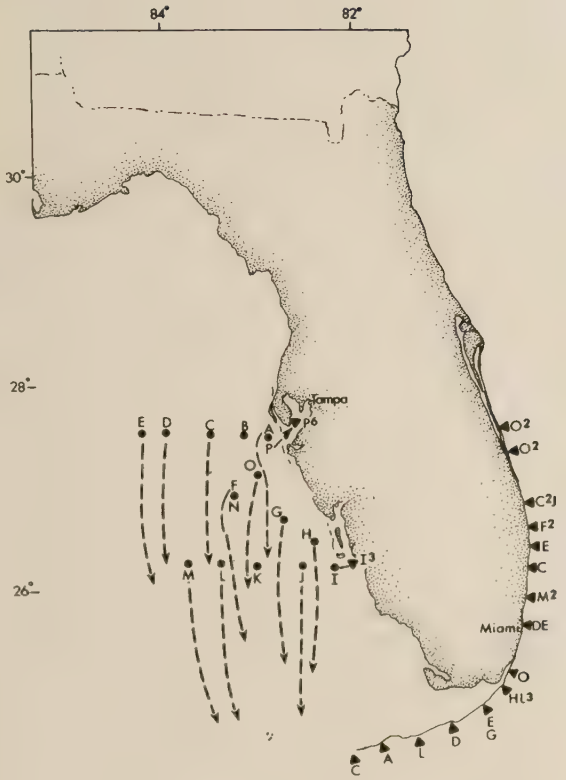

Figure 54. HC 23, 3-14 January 1966.

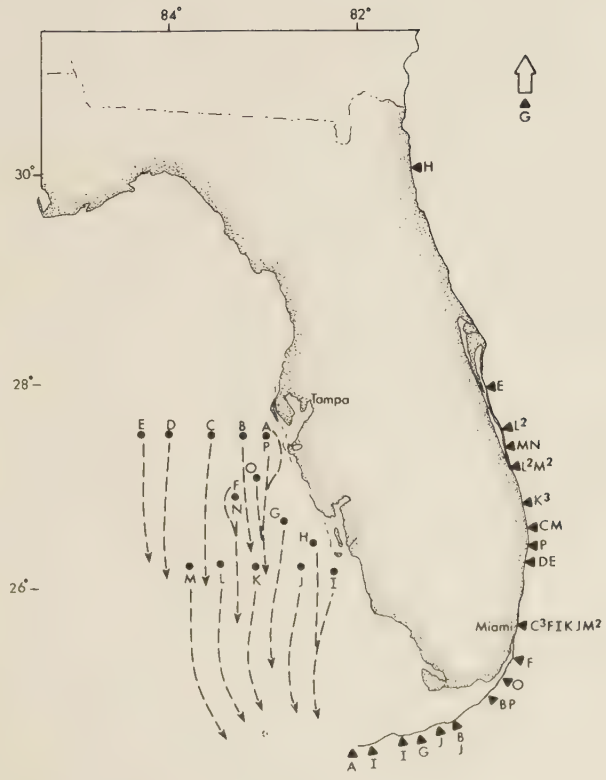

Figure 55. HC 24, 7-15 February 1966.

Figure 56. Loop Current position indicated by the 20° C isotherm surface at the 150 m contour level; 8-20 February 1966 (SUSIO, 1975).

Figure 57. HC 25, 3-22 March 1966.

Figure 58. HC 26, 6-13 April 1966.

Figure 59. HC 27, 2-12 May 1966.

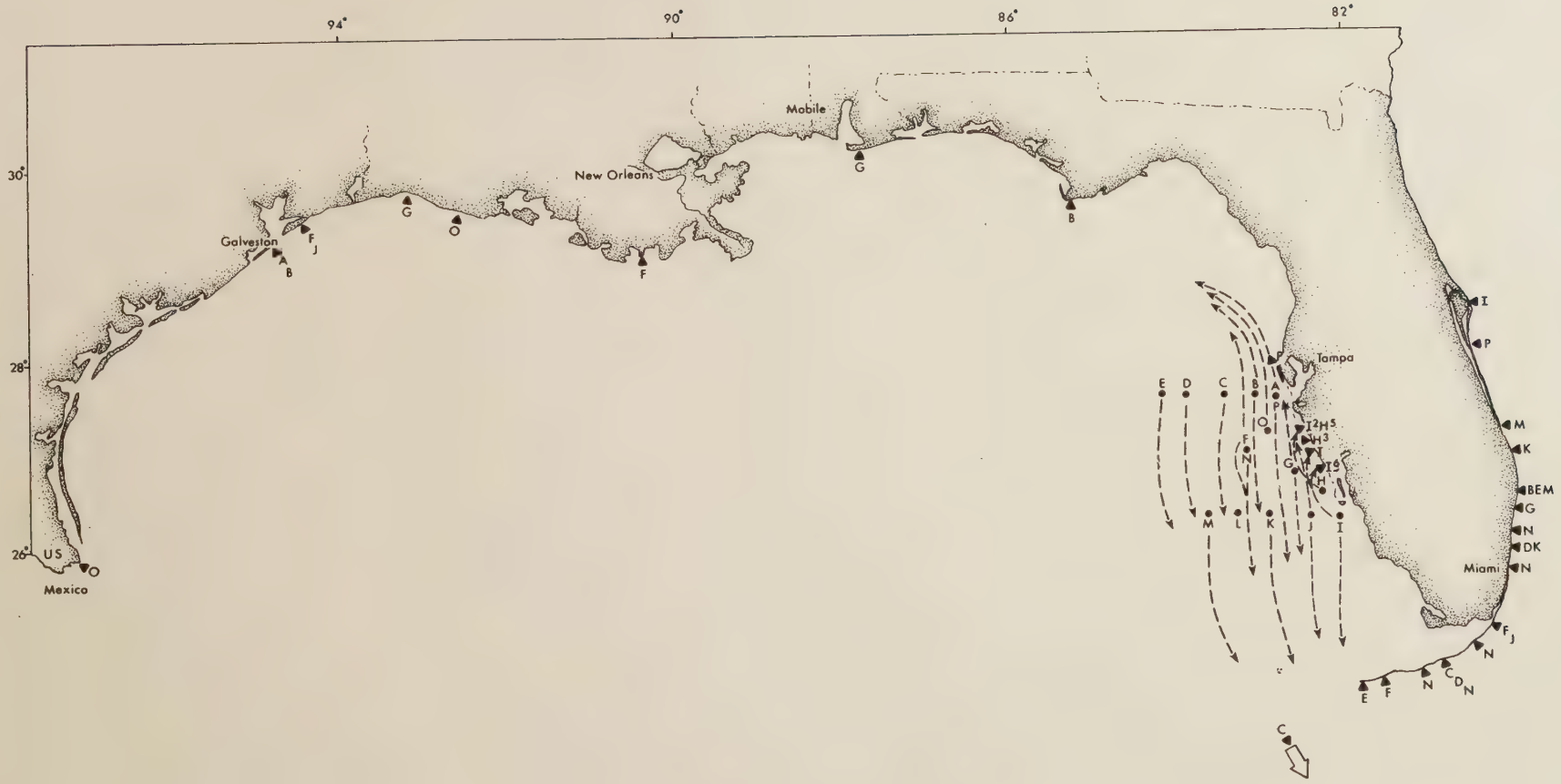

Figure 60. HC 28, 6-14 June 1966.

Figure 61. Loop Current position indicated by the 20° C isotherm surface at the 150 m contour level; 1-24 June 1966 (SUSIO, 1975).

Figure 62. Loop Current position indicated by the 20° C isotherm surface at the 150 m contour level; 1-22 July 1966 (SUSIO, 1975).

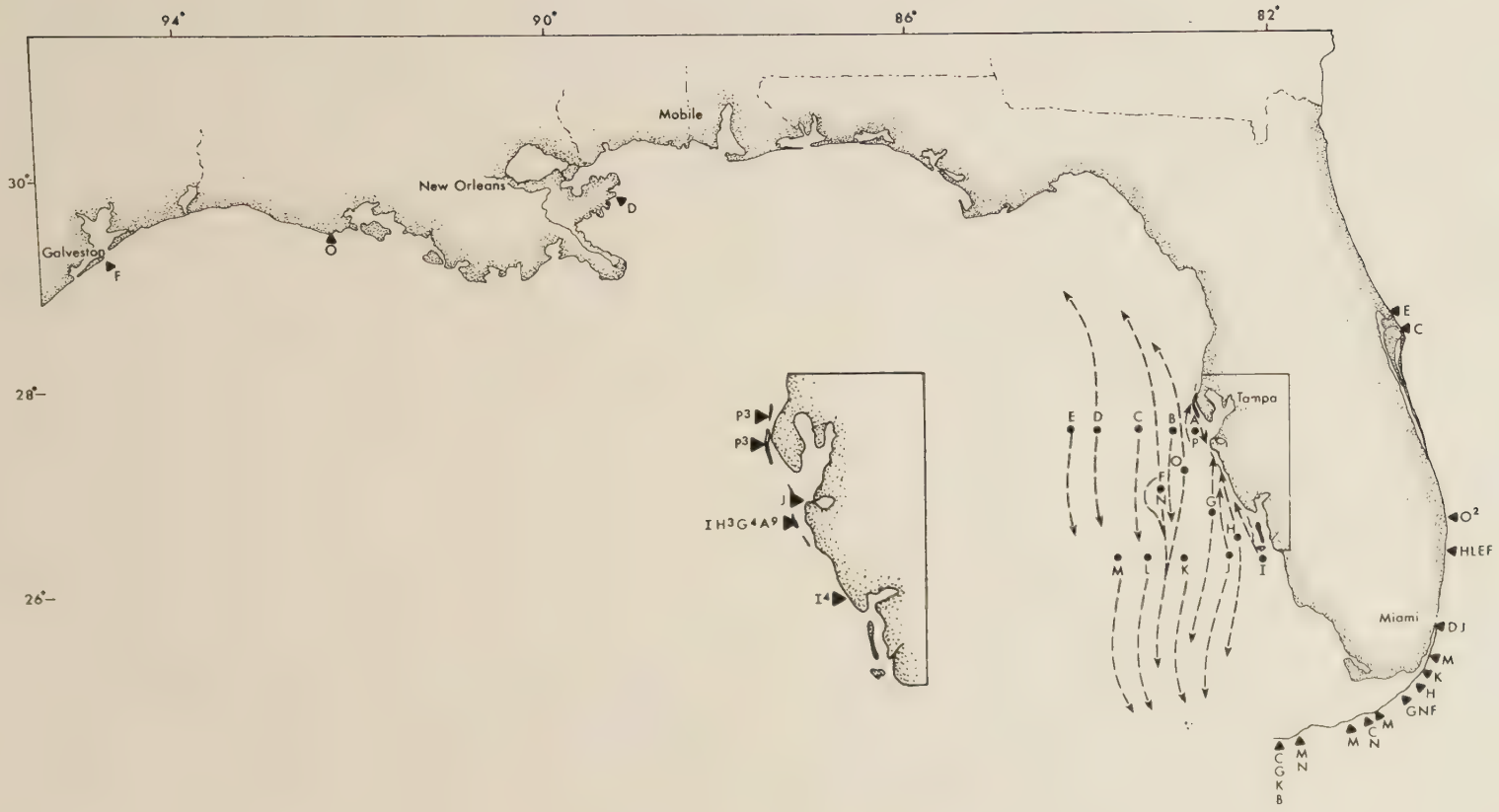

Figure 63. HC 29, 2-7 July 1966.

Figure 64. Loop Current position indicated by the 20° C isotherm surface at the 150 m contour level; 1-18 August 1966 (SUSIO, 1975).

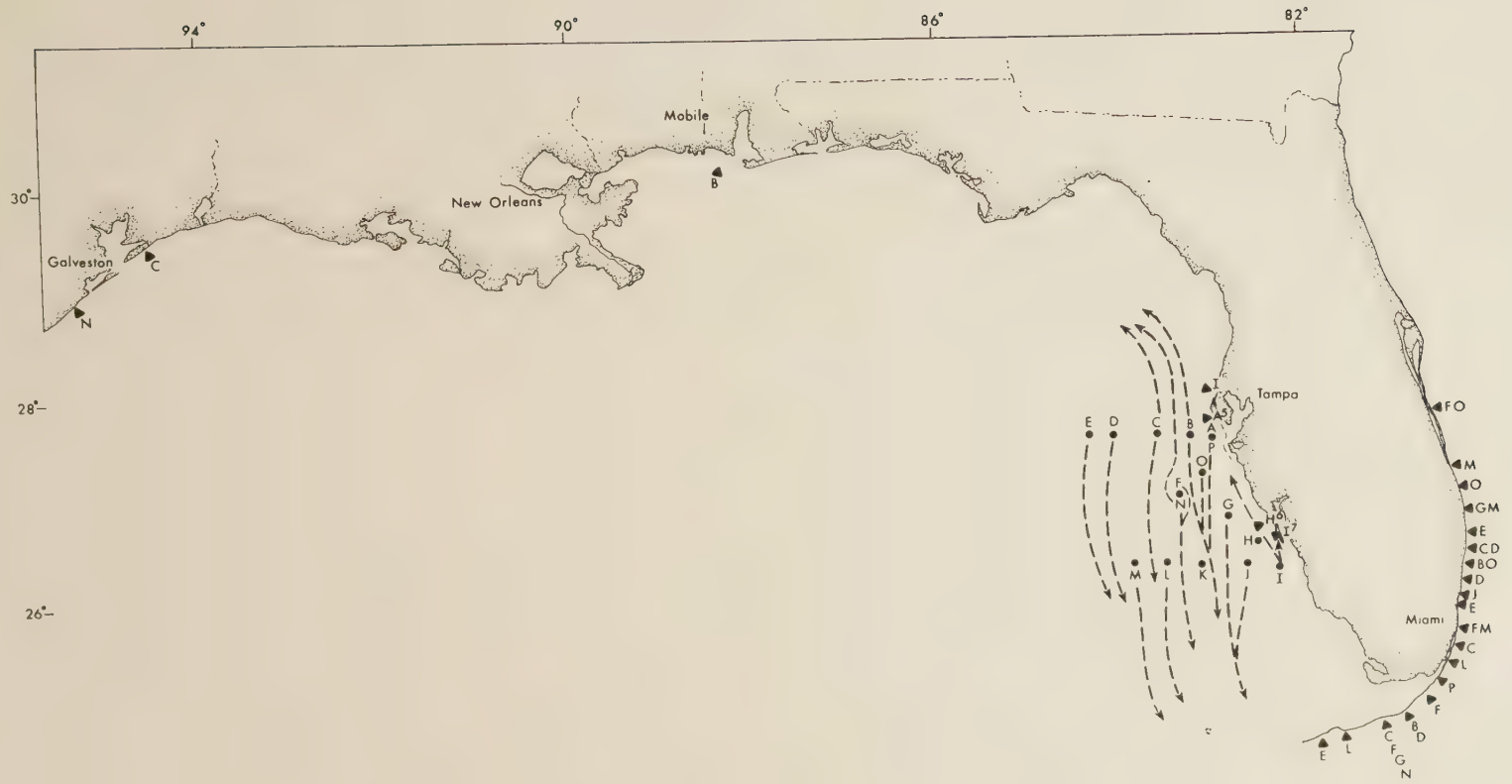

Figure 65. HC 30, 1-7 August 1966.

Figure 66. HC 31, 31 August - 6 September 1966.

Figure 67. Loop Current position indicated by the 20° C isotherm surface at the 150 m contour level; 27 October - 13 November 1966 (SUSIO, 1975).

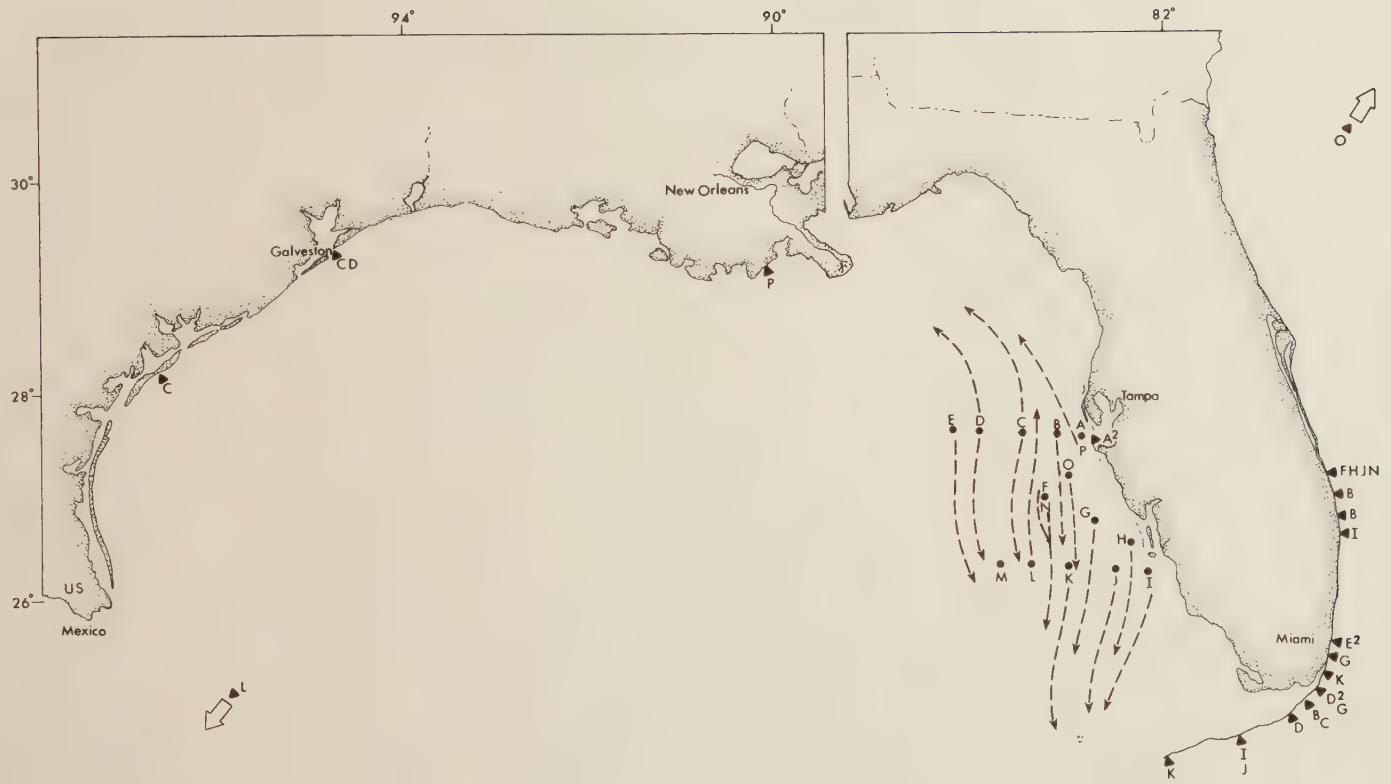

Figure 68. HC 32, 8-14 October 1966.

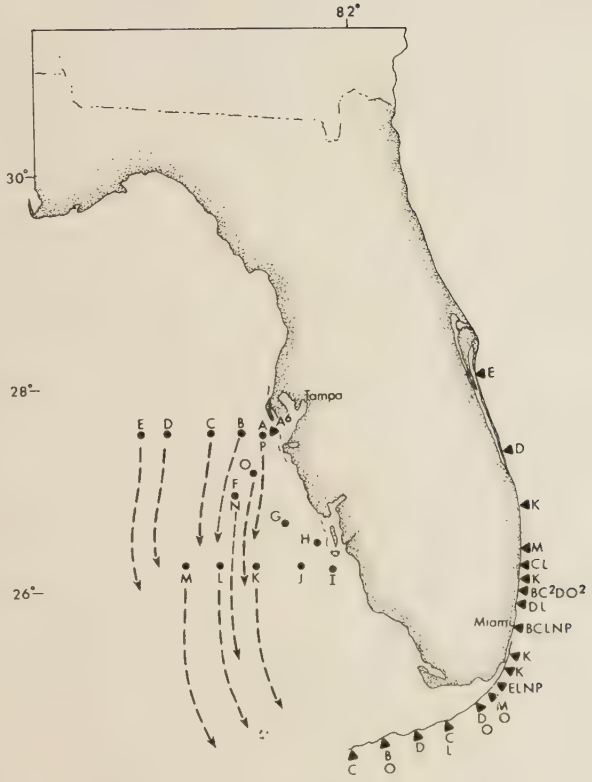

Figure 69. HC 33, 6-14 November 1966.

Figure 70. HC 34, 1-8 December 1966.

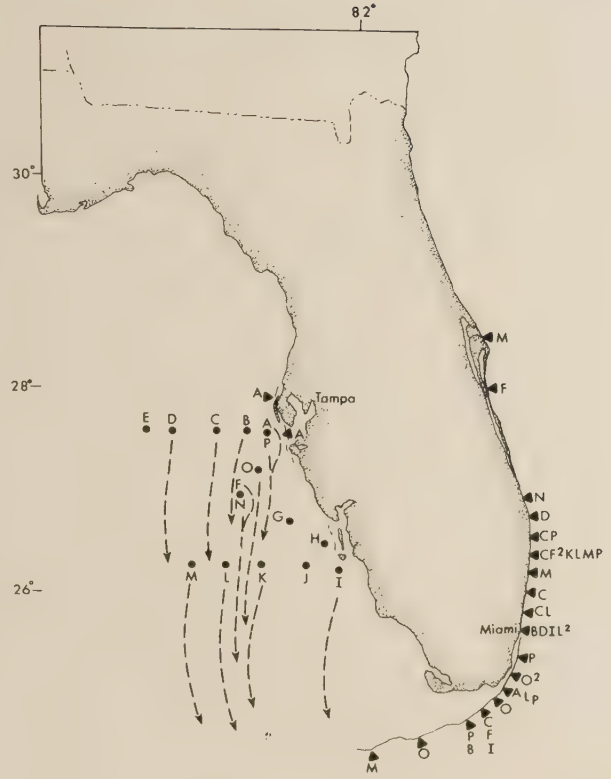

Figure 71. HC 35, 6-14 January 1967.

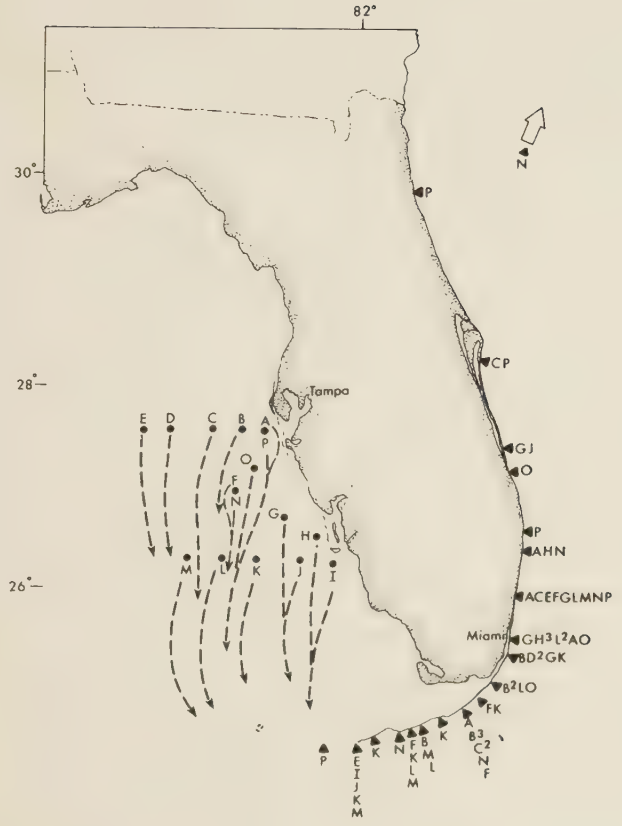

Figure 72. HC 36, 5-16 February 1967.

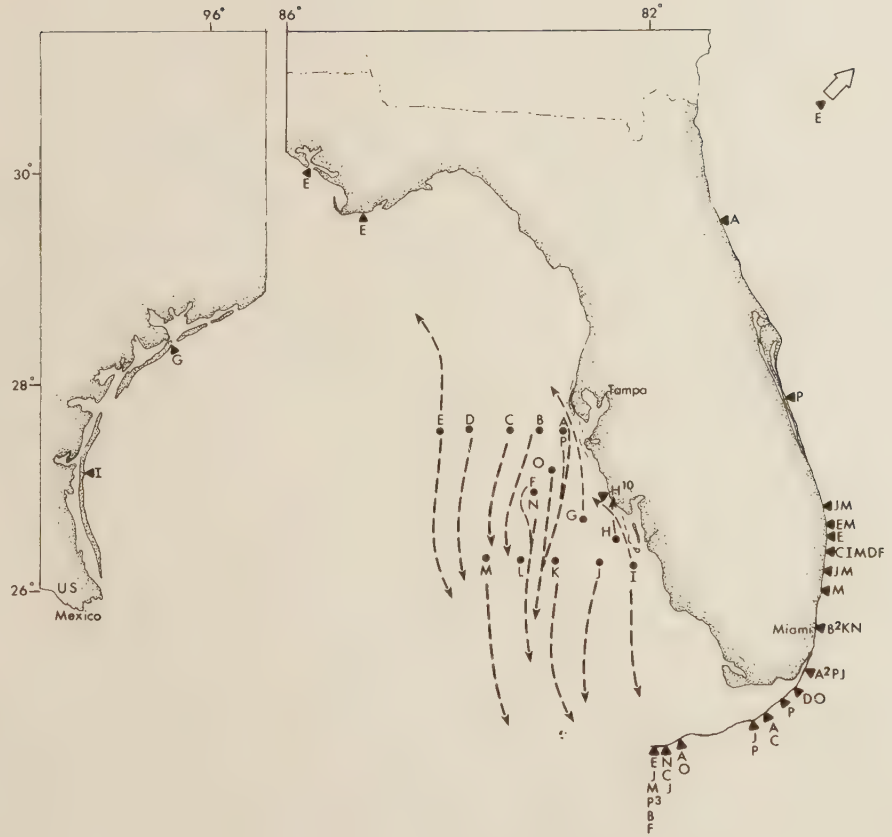

Figure 73. HC 37, 2-10 March 1967.

Figure 74. HC 38, 3-9 April 1967.

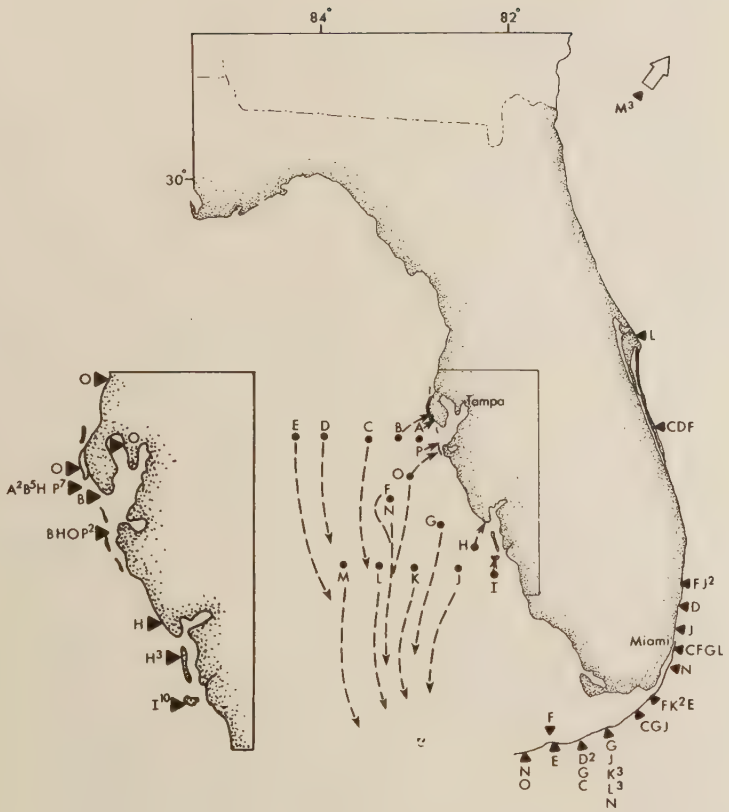

Figure 75. HC 39, 11-17 May 1967.

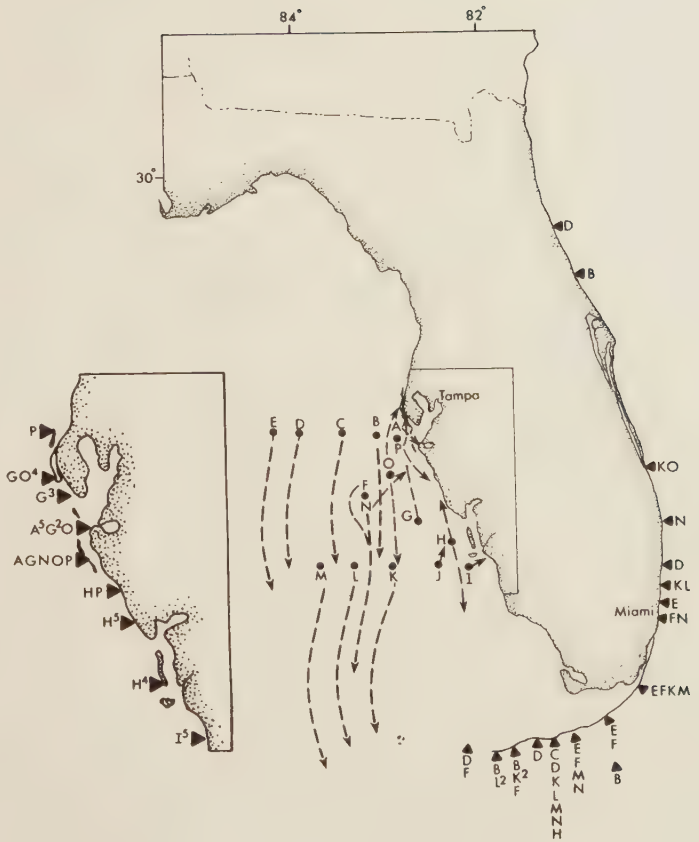

Figure 76. HC 40, 2-8 June 1967.

Figure 77. Loop Current position indicated by the 20° C isotherm surface at the 150 m contour level; 5 June - 2 July 1967 (SUSIO, 1975).

Figure 78. HC 41, 1-7 July 1967.

Figure 79. Loop Current position indicated by the 20° C isotherm surface at the 150 m contour level; 4-22 August 1967 (SUSIO, 1975).

Figure 80. HC 42, 1-9 August 1967.

Figure 81. HC 43, 31 August - 6 September 1967.

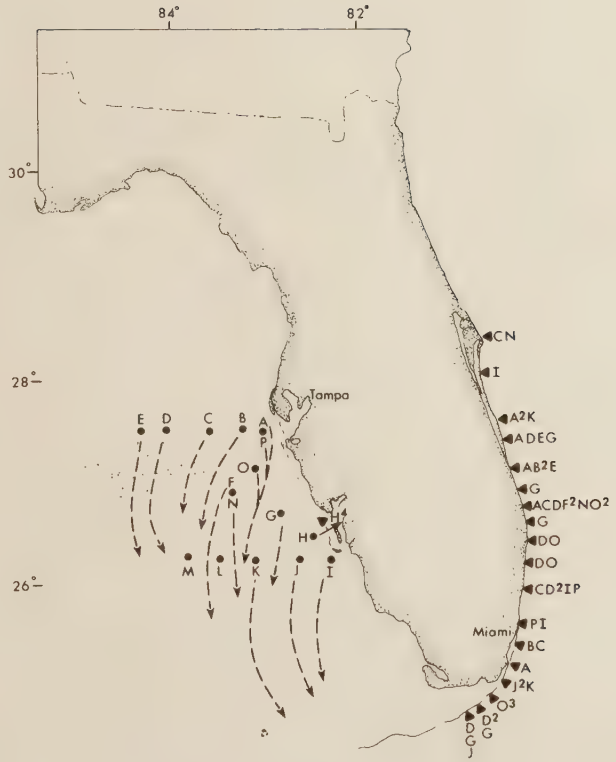

Figure 82. HC 44, 5-13 October 1967.

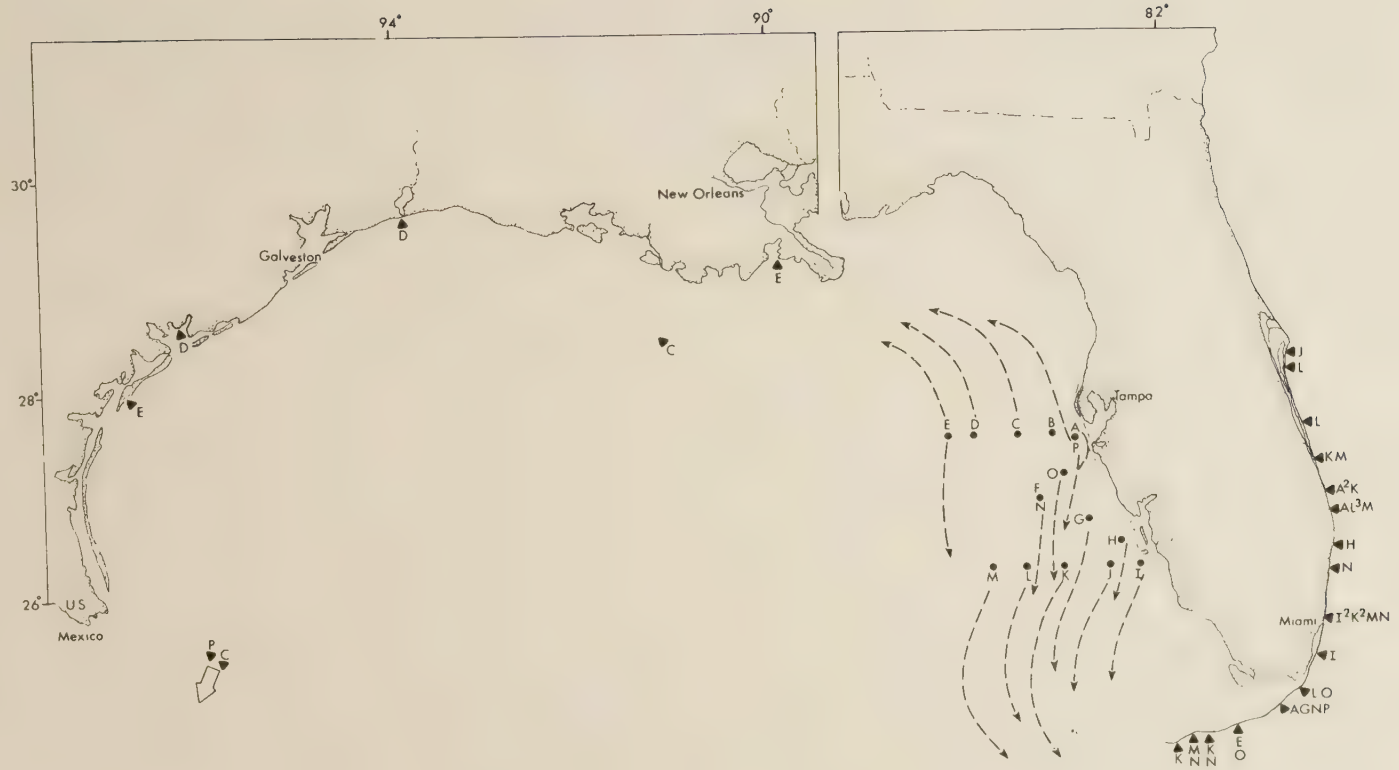

Figure 83. HC 45, 2-16 November 1967.

APPENDIX I

DRIFT BOTTLE DATA

Symbol	Definition
---	No data
*	Over one year
+	Beyond designated areas
?	Questionable data

Cruise No.: HC 18 3-8 August 1965

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #4781-4790 3 Aug.		No returns						
B #4771-4780 3 Aug.		No returns						
C #4761-4770	4762	29 Apr. 66	IV	Freeport, Tex.	28°56′	95°18′	269	2.4
3 Aug.	4769	18 Sept. 65	V	Golden Bch., Fla.	25°58′	80°08′	46	8.9
D #4821-4830 3 Aug.	4821	17 Apr. 66	IV	Padre Is., Tex.	26°49′	97°21′	257	2.8
E #4751-4760 4 Aug.	4752	5 Feb. 66	IV	Padre Is., Tex.	27°12′	97°22′	186	3.8
F #4841-4850	4841	17 Oct. 65	V	Jupiter, Fla.	26°56′	80°04′	73	5.9
5 Aug.	4845	16 Oct. 65	V	Pt. Everglades Inlet, Fla.	26°06′	80°07′	72	5.2
	4847	21 Sept. 65	V	Hobe Sound, Fla.	27°04′	80°07′	47	9.3
G #4811-4820	4817	2 July 66	V	Boynton Bch., Fla.	26°32′	80°03′	331	1.2
5 Aug.	4819	24 Apr. 66	IV	Pt. Mansfield, Tex.	26°31′	97°16′	262	3.0
H #4831-4840	4831	18 Oct. 65	V	Palm Bch., Fla.	26°42′	80°03′	74	5.1
5 Aug.	4833	1 Apr. 66	M	Veracruz, Mex.	19°09′	96°10′	239	3.6+
	4835	3 June 66	IV	Pt. Aransas, Tex.	27°50′	97°03′	302	2.6
I #4801-4810	4804	19 Dec. 65	IV	Padre Is., Tex.	26°22′	97°12′	135	6.0
6 Aug.	4805	18 June 66	IV	Holly Bch., La.	29°46′	93°30′	316	2.0
	4806	27 Nov. 65	IV	Colorado R., Tex.	28°35′	96°02′	113	6.7
J #4851-4860	4855	14 Sept. 66	V	Miami, Fla.	25°47′	80°12′	404	*
6 Aug.	4856	18 Sept. 65	V	Juno Bch., Fla.	26°52′	80°05′	43	8.9

K – Bottles released at Station L

Cruise No.: HC 18 (Continued) 3-8 August 1965

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
L #4861-4880 7 Aug.	4864	25 Sept. 65	V	Key West, Fla.	24°33′	81°49′	49	3.8
M #4881-4890 7 Aug.	4883	28 Apr. 66	IV	San Bernard R., Tex.	28°50′	95°25′	264	2.7
	4886	20 Mar. 66	IV	Padre Is., Tex.	26°58′	97°23′	225	3.2
N #4881-4890 8 Aug.	4892	1 Oct. 65	V	Ocean Ridge, Fla.	26°32′	80°03′	54	7.5
	4896	4 Oct. 65	V	Patrick AFB, Fla.	28°15′	80°36′	57	9.0
	4897	20 Jan. 68	V	No Name Key, Fla.	24°41′	81°19′	895	*
	4898	21 Oct. 65	V	Cape Kennedy Bch., Fla.	28°36′	80°35′	74	7.3
	4900	21 Sept. 66	V	Miami, Fla.	25°25′	80°19′	409	*
O #4901-4910 8 Aug.		No returns						
P #4911-4920 8 Aug.		No returns						

Cruise No.: HC 19 30 August-5 September 1965

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #2001-2010 30 Aug.	2003	13 May 66	M	Mexico Bch., Mex.	24°57′	97°31′	256	1.7+
	2005	18 Apr. 66	IV	Matagorda, Tex.	28°22′	96°22′	231	3.0
B #2011-2020 30 Aug.	2016	2 May 66	IV	Brazos R., Tex.	28°53′	95°22′	245	2.7
C #2021-2030 31 Aug.	2023	18 Dec. 65	IV	Padre Is., Tex.	26°58′	97°23′	109	6.9
	2026	27 Jan. 66	M	Veracruz, Mex.	19°12′	96°09′	149	5.6+
	2029	26 Apr. 66	IV	Padre Is., Tex.	27°36′	97°12′	238	3.2
D #2031-2040 31 Aug.	2034	4 Mar. 66	IV	Western Gulf of Mex. 2 mi from Pt. Isabel, Tex.	26°04′	96°07′	185	3.7
E #2041-2050 31 Aug.	2041	13 Mar. 66	IV	S Padre Is., Tex.	26°24′	97°13′	194	3.6
	2045	16 July 66	IV	High Is., Tex.	29°34′	94°19′	319	1.8
F #2051-2060 1 Sept.	2051	7 Apr. 66	M	Tamaulipas, Mex.	23°50′	97°42′	218	3.7+
	2055	30 May 66	IV	Pt. Aransas, Tex.	27°55′	96°59′	271	2.7
	2059	4 July 66	IV	Padre Is., Tex.	26°51′	97°21′	306	2.5

Cruise No.: HC 19 (Continued) 30 August-5 September 1965

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
G #2061-2070 1 Sept.		No returns						
H #2071-2080 1 Sept.	2071	3 Nov. 65	V	Bahia Honda, Fla.	24°40′	81°16′	63	3.3
	2073	2 Nov. 65	V	Marathon Shores, Fla.	24°43′	81°06′	62	3.5
	2074	3 Dec. 65	IV	Mustang Is., Tex.	27°51′	97°04′	93	8.5
	2078	7 Nov. 65	V	Coco Plum Bch., Fla.	24°44′	81°00′	67	3.3
	2079	1 Mar. 66	V	Marathon, Fla.	24°43′	81°06′	181	1.2
	2080	8 Feb. 66	V	Long Key, Fla.	24°44′	80°50′	160	1.5
I #2081-2090 3 Sept.	2084	18 July 66	IV	Padre Is., Tex.	26°22′	97°12′	18	2.6
J #2091-2100 3 Sept.	2091	2 July 66	V	Lower Matecumbe Key, Fla.	24°51′	80°44′	302	0.8
	2095	12 Nov. 65	V	Flagler Bch., Fla.	29°29′	81°08′	70	8.0
	2099	9 Oct. 66	IV	Padre Is., Tex.	27°31′	97°15′	401	*
K #2101-2110 4 Sept.	2101	25 Sept. 65	V	Wabasso, Fla.	27°46′	80°25′	21	21.1
	2105	4 Dec. 65	V	Plantation Key, Fla.	24°58′	80°33′	91	2.8
	2106	20 Sept. 65	V	Vero Bch., Fla.	27°38′	80°24′	16	27.1
	2107	21 Sept. 65	V	S Melbourne Bch., Fla.	28°04′	80°33′	17	27.2
	2109	20 Nov. 65	V	Miami, Fla.	25°30′	80°11′	77	3.8
	2110	20 Sept. 65	V	Wabasso, Fla.	27°46′	80°25′	16	27.7
L #2111-2120 4 Sept.	2113	28 Jan. 66	M	Alvarado, Mex.	18°47′	95°45′	146	5.5+
M #2121-2130 4 Sept.	2124	19 July 66	IV	Matagorda Is., Tex.	28°15′	94°56′	318	2.8
N #2131-2140 5 Sept.	2133	29 Dec. 65	III	South Pass, Mississippi R., La.	28°59′	89°06′	115	3.0
O #2141-2150 5 Sept.		No returns						
P #4931-4936 5 Sept.	4934	18 June 66	IV	Padre Is., Tex.	27°17′	97°21′	286	2.7
	4936	17 May 66	IV	High Is., Tex.	29°36′	94°00′	254	2.5

Cruise No.: HC 20 4-14 October 1965

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #0074-0083	0076	9 Oct. 65	I	Mullet Key, Fla.	27°37′	82°44′	5	1.2
4 Oct.	0080	10 Oct. 65	I	Egmont Key, Fla.	27°35′	82°45′	6	0.6
	0081	15 Oct. 65	I	Anna Maria Is., Fla.	27°28′	82°43′	11	0.95
	0082	7 Oct. 65	I	Anna Maria Is., Fla.	27°28′	82°43′	3	2.0
B #0084-0093	0091	1 Mar. 67	IV	Pt. Isabel, Tex.	26°34′	97°16′	513	*
4 Oct.								
C #0094-0103	0099	24 Apr. 66	M	El Conchal, Mex.	24°57′	97°53′	201	3.9+
5 Oct.								
D #0104-0113	0106	7 June 66	IV	Corpus Christi, Tex.	27°18′	97°21′	245	2.9
5 Oct.	0111	11 June 69	IV	3 mi E of Colorado R., Tex.	28°37′	95°55′	1345	*
E #0114-0123	0115	10 Feb. 66	V	Upper Matecumbe Key, Fla.	24°55′	80°38′	128	2.6
5 Oct.								
F #0124-0133	0124	25 Nov. 65	V	Ormond Bch., Fla.	29°17′	81°02′	50	11.8
6 Oct.	0125	8 Dec. 65	V	Ft. Pierce, Fla.	27°28′	80°18′	63	7.4
	0126	6 Nov. 65	V	Marineland, Fla.	29°36′	81°10′	31	19.7
	0131	12 Nov. 65	V	Daytona Bch., Fla.	29°13′	81°00′	37	16.3
	0132	3 Nov. 65	V	Canova Bch., Fla.	28°09′	80°35′	28	18.2
	0133	30 Oct. 65	V	Hobe Sound, Fla.	27°04′	80°07′	24	18.2
G #0134-0143	0134	7 Nov. 65	V	Miami Bch., Fla.	25°48′	80°08′	32	10.2
6 Oct.	0135	1 Nov. 65	V	Haulover Bch., Fla.	25°54′	80°07′	26	13.2
	0137	13 Dec. 65	V	Key Largo, Fla.	25°10′	80°29′	68	4.3
	0139	11 Mar. 66	V	Key Largo, Fla.	25°10′	80°29′	156	1.9
	0142	11 Nov. 65	V	Biscayne Bay, Fla.	25°43′	80°15′	36	9.2
	0143	11 July 66	V	Miami, Fla.	25°47′	80°12′	278	1.2
H #0144-0153	0144	19 Oct. 65	I	Boca Grande, Fla.	26°44′	82°16′	13	0.7
6 Oct.	0145	19 Oct. 65	I	Gasparilla Is., Fla.	26°45′	82°15′	13	0.7
	0146	2 Jan. 66	I	Boca Grande, Fla.	26°44′	82°16′	88	0.1
	0149	3 Nov. 65	I	Boca Grande, Fla.	26°44′	82°16′	28	0.3
	0150	21 Oct. 65	I	Boca Grande, Fla.	26°44′	82°16′	15	0.6
	0152	19 Oct. 65	I	Boca Grande, Fla.	26°44′	82°16′	13	0.7
	0153	14 Nov. 65	I	Boca Grande, Fla.	26°44′	82°16′	39	0.2
I #0154-0163	0154	8 Feb. 66	V	Boynton Bch., Fla.	26°32′	80°03′	119	3.1
12 Oct.	0155	16 Dec. 65	V	Key Largo, Fla.	25°07′	80°23′	65	4.3
	0156	23 Feb. 66	V	Pompano Bch., Fla.	26°13′	80°05′	134	2.6
	0162	1 Aug. 66	V	Old Rhodes Key, Fla.	25°22′	80°14′	293	1.0

Cruise No.: HC 20 (Continued) 4-14 October 1965

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
J #0164-0173	0169	10 Apr. 67	V	Elliott Key, Fla.	25°26′	80°11′	545	*
12 Oct.	0171	6 Nov. 65	V	Ft. Pierce, Fla.	27°28′	80°18′	25	16.6
	0173	6 Nov. 65	V	Tavernier, Fla.	25°01′	80°32′	25	10.4
K #0174-0183	0175	3 Nov. 65	V	Indialantic, Fla.	28°00′	80°32′	21	21.9
13 Oct.	0178	16 Nov. 65	V	Ft. Pierce, Fla.	27°28′	80°18′	34	12.5
	0179	5 Nov. 65	V	Playalinda Bch., Fla.	28°36′	80°35′	23	21.9
	0180	1 Nov. 65	V	Ft. Pierce, Fla.	27°34′	80°20′	19	22.8
	0182	3 Nov. 65	V	Ft. Pierce Inlet, Fla.	27°29′	80°18′	21	20.4
L #0184-0193	0188	31 July 66	IV	Metairie, La.	29°03′	90°55′	291	1.5
13 Oct.								
M #0194-0203	0195	26 Apr. 66	IV	Galveston Is., Tex.	29°16′	94°50′	195	3.2
13 Oct.								
N #0204-0213	0210	4 May 66	M	Matamoras, Mex.	25°52′	97°10′	202	3.7+
14 Oct.								
O #0214-0223	0223	14 Mar. 66	M	Tamaulipas, Mex.	25°52′	97°09′	151	5.1+
14 Oct.								
P #0224-0233	0233	29 Dec. 65	V	Ft. Lauderdale, Fla.	26°08′	80°06′	76	5.4
14 Oct.								

Cruise No.: HC 21 8-14 November 1965

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #5001-5010	5006	1 Jan. 66	V	Cocoa Bch., Fla.	28°19′	80°36′	54	10.2
8 Nov.								
B #5011-5020		No returns						
8 Nov.								
C #5021-5030		No returns						
8 Nov.								
D #5031-5040	5034	29 Apr. 66	IV	Matagorda, Tex.	28°40′	95°55′	171	3.8
9 Nov.	5039	1 Oct. 67	IV	Matagorda, Tex.	28°40′	95°55′	691	*

Cruise No.: HC 21 (Continued) 8-14 November 1965

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
E #5041-5050	5042	5 June 66	IV	Mustang Is., Tex.	27°42′	97°09′	208	3.3
9 Nov.	5049	9 Mar. 66	V	Lake Worth, Fla.	26°37′	80°03′	120	3.8
F #5051-5060	5053	20 Oct. 66	V	Key Largo, Fla.	25°02′	80°29′	345	0.9
9 Nov.	5055	3 Feb. 66	V	Grassy Key, Fla.	24°45′	80°57′	86	3.0
	5056	28 Feb. 71	V	Key Largo, Fla.	25°11′	80°21′	1937	*
	5057	14 Dec. 65	V	Port Everglades, Fla.	26°05′	80°07′	35	10.8
	5058	14 Dec. 65	V	Miami, Fla.	25°47′	80°10′	35	10.2
	5059	7 May 67	V	N Key Largo, Fla.	25°19′	80°16′	537	*
	5060	21 Feb. 68	V	Key Largo, Fla.	25°08′	80°23′	834	*
G #5061-5070		No returns						
9 Nov.								
H #5071-5080	5071	27 Dec. 65	V	Marathon, Fla.	24°43′	81°06′	48	4.6
9 Nov.	5072	11 Dec. 65	V	Boca Raton, Fla.	26°21′	80°04′	32	11.3
	5078	20 Sept. 66	V	Key Largo, Fla.	25°19′	80°16′	315	0.9
	5079	6 Dec. 65	V	Juno Bch., Fla.	26°52′	80°05′	27	14.5
	5080	25 Dec. 65	V	Palm Bch., Fla.	26°42′	80°03′	46	8.2
I #5081-5090	5082	29 Dec. 65	V	Key Largo, Fla.	25°11′	80°22′	47	6.0
12 Nov.	5084	12 Dec. 65	V	Miami, Fla.	25°30′	80°05′	30	10.0
	5085	26 Dec. 65	V	Marathon, Fla.	24°43′	81°06′	44	5.0
	5086	10 Mar. 66	V	Tavernier, Fla.	25°01′	80°31′	118	2.3
	5087	30 Jan. 66	V	Key Largo, Fla.	25°11′	80°22′	79	3.6
	5090	7 Feb. 66	V	Grassy Key, Fla.	24°45′	80°57′	87	2.6
J #5091-5100	5091	23 Jan. 66	V	Vero Bch., Fla.	27°30′	80°18′	72	6.0
12 Nov.	5092	7 Jan. 66	V	Marathon, Fla.	24°43′	81°06′	56	3.8
	5094	23 Jan. 66	V	Vero Bch., Fla.	27°33′	80°19′	72	6.0
	5095	19 Dec. 65	V	Islamorada, Fla.	24°56′	80°37′	37	6.7
	5097	29 Dec. 65	V	Plantation Key, Fla.	24°58′	80°33′	47	5.4
	5100	14 Dec. 65	V	Key West, Fla.	24°33′	81°46′	32	5.6
K #5101-5110	5101	8 Dec. 65	V	Hollywood Bch., Fla.	26°01′	80°07′	26	12.9
12 Nov.	5102	12 Sept. 66	V	Key Largo, Fla.	25°10′	80°21′	304	0.9
	5104	12 Feb. 67	V	Julia Is., Fla.	25°07′	80°23′	457	*
	5105	16 Jan. 66	V	Julia Is., Fla.	25°07′	80°23′	65	4.2
	5106	12 Dec. 65	V	Miami Bch., Fla.	25°48′	80°08′	30	10.5
	5107	31 Dec. 65	V	Cocoa Bch., Fla.	28°18′	80°36′	49	9.8
	5110	20 Dec. 65	V	N Delray Bch., Fla.	26°28′	80°04′	38	9.5

Cruise No.: HC 21 (Continued) 8-14 November 1965

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
L #5111-5120 13 Nov.	5120	15 May 66	IV	Padre Is., Tex.	27°10′	97°21′	183	4.1
M #5121-5130 13 Nov.	5129	16 Jan. 66	V	Julia Is., Fla.	25°02′	80°29′	64	4.5
N #5131-5140	5132	15 Apr. 67	V	Key West, Fla.	24°33′	81°49′	517	*
14 Nov.	5134	15 Dec. 65	V	Key West, Fla.	24°33′	81°49′	31	7.1
	5136	18 Dec. 65	V	Duck Key, Fla.	24°46′	80°55′	34	7.7
	5137	9 Aug. 67	V	Ormond Bch., Fla.	29°24′	81°05′	633	*
	5138	10 Feb. 66	V	Marathon, Fla.	24°43′	81°06′	88	2.9
	5139	2 Feb. 66	V	Key Largo, Fla.	25°11′	80°22′	80	2.8
O #5141-5150	5149	25 Dec. 65	V	Ft. Pierce, Fla.	27°27′	80°17′	41	11.7
14 Nov.	5150	25 Sept. 66	V	Plantation Key, Fla.	24°58′	80°38′	315	1.0
P #5151-5160 14 Nov.	5157	25 Dec. 65	V	Lantana, Fla.	26°35′	80°02′	41	10.6

Cruise No.: HC 22 3-14 December 1965

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #5161-5170	5161	5 Dec. 65	I	Egmont Key, Fla.	27°35′	82°45′	2	1.9
3 Dec.	5162	23 Jan. 66	V	Elliott Key, Fla.	25°26′	80°12′	51	7.3
	5164	4 Dec. 65	I	Egmont Key, Fla.	27°35′	82°45′	1	3.8
	5165	4 Dec. 65	I	Egmont Key, Fla.	27°35′	82°45′	1	3.8
	5166	4 Dec. 65	I	Egmont Key, Fla.	27°35′	82°45′	1	3.8
	5167	4 Dec. 65	I	Egmont Key, Fla.	27°35′	82°45′	1	3.8
	5168	6 Apr. 66	V	Pennekamp Park, Key Largo, Fla.	25°01′	80°23′	124	2.7
	5170	7 Dec. 65	N	Chesapeake Bay, Baltimore, Md.			4	?
B #5171-5180	5173	22 Jan. 66	V	Miami Bch., Fla.	25°48′	80°08′	50	7.8
3 Dec.	5175	27 Dec. 65	V	Miami Bch., Fla.	25°48′	80°08′	24	16.2
	5179	18 Mar. 66	V	Deerfield Bch., Fla.	26°19′	80°04′	105	4.0
	5180	28 Dec. 65	V	Lauderdale-by-the-Sea, Fla.	26°09′	80°06′	25	16.6
C #5181-5190	5183	27 Feb. 66	V	Key Largo, Fla.	25°11′	80°22′	86	3.0
3 Dec.	5185	6 Jan. 66	V	Marathon Shores, Fla.	24°43′	81°06′	34	8.6

Cruise No.: HC 22 (Continued) 3-14 December 1965

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
C #5181-5190	5186	30 Dec. 65	V	Miami Bch., Fla.	25°48′	80°08′	27	14.6
3 Dec.	5187	1 May 66	V	N Key Largo, Fla.	25°19′	80°16′	149	2.5
	5190	22 Jan. 66	V	Summerland Key, Fla.	24°40′	81°27′	50	5.5
D #5191-5200	5192	1 May 66	IV	Padre Is., Tex.	27°08′	97°21′	148	4.8
4 Dec.	5193	16 July 66	IV	N Padre Is., Tex.	26°22′	97°12′	224	3.1
E #5201-5210	5201	10 Aug. 75	V	Big Pine Key, Fla.	24°37′	81°21′	3536	*
4 Dec.	5202	10 Feb. 66	V	Palm Bch., Fla.	26°42′	80°03′	68	6.8
F #5211-5220	5212	1 Jan. 66	V	Jensen Bch., Fla.	27°13′	80°10′	28	16.1
4 Dec.	5213	30 Dec. 65	V	Plantation Key, Fla.	24°58′	80°33′	26	11.3
	5219	24 Dec. 65	V	Pompano Bch., Fla.	26°13′	80°05′	20	19.3
G #5221-5230	5221	18 Nov. 66	V	Ormond Bch., Fla.	29°17′	81°02′	349	1.6
4 Dec.	5222	27 Dec. 65	V	N Miami, Fla.	25°53′	80°11′	23	15.0
	5223	29 Oct. 68	V	Grassy Key, Fla.	24°46′	80°57′	1060	*
	5225	31 Dec. 65	V	Melbourne Bch., Fla.	28°04′	80°33′	27	17.9
	5227	25 Dec. 65	V	Miami Bch., Fla.	25°48′	80°08′	21	16.0
	5228	13 Jan. 66	V	Miami Bch., Fla.	25°48′	80°08′	40	8.4
	5229	2 Mar. 66	V	Ramrod Key, Fla.	24°39′	81°25′	88	2.5
	5230	26 Dec. 65	V	Miami, Fla.	25°30′	80°05′	22	14.3
H #5231-5240		No returns						
4 Dec.								
I # 5241-5250	5241	26 Aug. 66	V	Marathon Key, Fla.	24°43′	81°06′	263	0.8
6 Dec.	5246	21 Jan. 66	V	Hallandale Bch., Fla.	25°59′	80°07′	46	7.3
J #5251-5260	5252	4 Jan. 66	V	Marathon Key, Fla.	24°43′	81°06′	29	7.3
6 Dec.	5254	7 Jan. 66	V	Ft. Pierce, Fla.	27°33′	80°19′	32	13.4
	5257	12 Jan. 66	V	Vero Bch., Fla.	27°39′	80°24′	37	11.7
	5260	11 Jan. 66	V	Elliott Key, Fla.	25°29′	80°11′	36	8.2
K #5261-5270	5261	31 Dec. 65	V	Islamorada, Fla.	24°57′	80°36′	24	10.4
7 Dec.	5262	12 Jan. 66	V	Lignum Vitae Key, Fla.	24°54′	80°42′	36	6.8
	5263	28 Dec. 65	V	Pompano Bch., Fla.	26°13′	80°05′	21	16.5
	5264	26 Feb. 66	V	Miami, Fla.	25°30′	80°05′	81	3.7
	5266	17 Jan. 66	V	Vero Bch., Fla.	27°39′	80°21′	41	10.6
	5268	14 Jan. 66	V	N St. Lucie County Line, Fla.	27°34′	80°19′	38	11.3
	5270	6 Sept. 66	V	Lake Surprise, Fla.	25°11′	80°23′	273	1.1

Cruise No.: HC 22 (Continued) 3-14 December 1965

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
L #5271-5280	5274	12 Mar. 66	V	Elliott Key, Fla.	25°26′	80°12′	95	3.2
7 Dec.	5277	13 Jan. 66	V	Islamorada, Fla.	24°56′	80°37′	37	6.9
	5279	29 Dec. 65	V	N St. Lucie County Line, Fla.	27°34′	80°19′	22	19.8
	5280	25 Jan. 66	V	New Smyrna Bch., Fla.	28°49′	80°45′	49	10.8
M #5281-5290	5281	5 Jan. 66	V	Key Largo, Fla.	25°11′	80°22′	22	13.2
14 Dec.	5284	1 Jan. 66	V	Miami, Fla.	25°48′	80°08′	18	18.2
N #5291-5300	5291	12 Mar. 66	V	Hobe Sound, Fla.	27°04′	80°07′	88	5.0
14 Dec.	5292	23 Feb. 66	V	Hutchinson Is., Fla.	27°13′	80°10′	71	6.3
	5295	17 July 66	V	Key West, Fla.	24°33′	81°49′	215	1.0
	5298	7 June 66	V	Big Pine Key, Fla.	24°39′	81°20′	175	1.4
O #5301-5310	5303	23 Feb. 66	V	Plantation Key, Fla.	24°58′	80°33′	71	4.4
14 Dec.	5306	4 Apr. 66	V	Juno Bch., Fla.	26°52′	80°05′	111	4.0
P #5311-5320		No returns						
14 Dec.								

Cruise No.: HC 23 3-14 January 1966

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #5321-5330	5328	9 Nov. 69	V	Big Pine Key, Fla.	24°37′	81°21′	1406	*
3 Jan.								
B #5331-5340		No returns						
3 Jan.								
C #5341-5350	5342	10 Mar. 66	V	Jupiter Inlet, Fla.	26°56′	80°04′	66	7.1
3 Jan.	5344	11 Feb. 66	V	Key West, Fla.	24°33′	81°46′	39	6.6
	5346	1 May 66	V	Jupiter Inlet, Fla.	27°00′	80°07′	118	4.0
	5348	10 Feb. 66	V	Boca Raton, Fla.	26°21′	80°04′	38	11.4
D #5351-5360	5356	13 Mar. 66	V	Long Key, Fla.	24°49′	80°47′	68	4.7
4 Jan.	5357	19 Mar. 66	V	Miami Bch., Fla.	25°48′	80°08′	74	5.4
E #5361-5370	5362	22 Mar. 66	V	Boynton Bch., Fla.	26°32′	80°03′	77	5.9
4 Jan.	5365	29 Mar. 66	V	Upper Plantation Key, Fla.	25°00′	80°32′	84	4.1
	5367	9 Mar. 66	V	Miami Bch., Fla.	25°48′	80°08′	64	6.3

Cruise No.: HC 23 (Continued) 3-14 January 1966

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
F #5371-5380	5375	10 Mar. 66	V	Riviera Bch., Fla.	26°46′	80°02′	65	6.4
4 Jan.	5376	29 Mar. 66	V	Palm Bch., Fla.	26°42′	80°03′	84	4.9
G #5381-5390	5390	22 Oct. 66	V	Plantation Key, Fla.	24°58′	80°33′	291	0.9
4 Jan.								
H #5391-5400	5394	26 May 66	V	Key Largo, Fla.	25°11′	80°22′	142	2.0
4 Jan.								
I #5401-5410	5401	17 Jan. 66	I	Sanibel Is., Fla.	26°26′	82°02′	4	0.8
13 Jan.	5405	9 Apr. 67	I	Captiva Is., Fla.	26°30′	82°13′	451	*
	5407	20 Nov. 68	I	Lacosta Is., Fla.	26°39′	82°15′	1042	*
J #5411-5420	5416	12 Mar. 66	V	Jupiter, Fla.	26°58′	80°06′	58	6.7
13 Jan.								
K #5421-5430		No returns						
13 Jan.								
L #5431-5440	5432	24 Apr. 66	V	Big Pine Key, Fla.	24°39′	81°20′	100	2.1
14 Jan.	5433	27 Feb. 66	V	Key Largo, Fla.	25°10′	80°21′	44	6.4
	5436	20 Feb. 67	V	Julia Is., Fla.	25°08′	80°22′	401	*
	5440	26 Feb. 66	V	Key Largo, Fla.	25°11′	80°22′	43	6.6
M #5441-5450	5444	8 Feb. 66	V	Lauderdale-by-the-Sea, Fla.	26°09′	80°06′	25	14.2
14 Jan.	5448	8 Feb. 66	V	Dania Bch., Fla.	26°03′	80°07′	25	13.9
N #5451-5460		No returns						
14 Jan.								
O #5461-5470	5462	17 Mar. 66	V	Ft. Pierce, Fla.	27°27′	80°17′	62	7.8
14 Jan.	5463	12 Mar. 66	V	Ft. Pierce, Fla.	27°27′	80°17′	57	8.4
	5465	8 Apr. 67	V	Old Rhodes Key, Fla.	25°22′	80°14′	449	*
	5468	18 Mar. 66	V	S Vero Bch., Fla.	27°29′	80°21′	63	7.7
	5469	15 Mar. 66	V	Vero Bch., Fla.	27°39′	80°21′	60	8.1
P #5471-5480	5471	9 May 66	I	Sunshine Skyway, St. Pete., Fla.	27°37′	82°37′	115	0.1
14 Jan.	5472	22 Mar. 66	I	,,	27°37′	82°37′	67	0.2
	5474	15 Feb. 66	I	,,	27°37′	82°37′	32	0.3
	5475	21 Jan. 66	I	,,	27°37′	82°37′	7	1.8
	5478	5 Aug. 66	I	E Tampa Bay, Fla.	27°51′	81°24′	203	0.1
	5479	10 July 66	I	Sunshine Skyway, St. Pete., Fla.	27°35′	82°37′	177	0.1

Cruise No.: HC 24 7-15 February 1966

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #5481-5490 7 Feb.	5489	9 June 66	V	Key West, Fla.	24°33′	81°46′	122	2.0
B #5491-5500	5499	30 Oct. 70	V	Julia Is., Fla.	25°07′	80°23′	1726	*
7 Feb.	5500	30 July 71	V	Shell Key, Fla.	24°56′	80°40′	1999	*
C #5501-5510	5501	20 Mar. 66	V	Miami, Fla.	25°30′	80°05′	41	9.2
7 Feb.	5502	29 Mar. 66	V	Palm Bch., Fla.	26°42′	80°03′	50	9.0
	5504	20 Mar. 66	V	Miami, Fla.	25°48′	80°08′	41	7.9
	5509	20 Mar. 66	V	Miami, Fla.	25°54′	80°07′	41	9.8
D #5511-5520 8 Feb.	5512	17 Mar. 66	V	Delray Bch., Fla.	26°28′	80°04′	37	12.0
E #5521-5530	5523	21 Apr. 66	V	Melbourne Bch., Fla.	28°04′	80°34′	72	7.7
8 Feb.	5524	12 Apr. 66	V	Delray Bch., Fla.	26°28′	80°04′	63	7.2
F #5531-5540	5539	5 Apr. 66	V	Elliott Key, Fla.	25°26′	80°12′	36	9.3
8 Feb.	5540	? Mar. 66	V	Key Biscayne, Fla.	25°41′	80°10′	?	?
G #5541-5550	5546	28 Nov. 68	N	Turtle Is., S.C.	32°04′	80°54′	1024	*+
8 Feb.	5549	13 July 66	V	Marathon, Fla.	24°43′	81°02′	155	1.5
H #5551-5560 8 Feb.	5551	28 June 66	V	S Ponte Vedra Bch., Fla.	30°14′	81°23′	140	4.4
I #5561-5570	5562	29 May 66	V	Bahia Honda Key, Fla.	24°40′	81°16′	104	2.0
14 Feb.	5564	17 June 66	V	Miami, Fla.	25°47′	80°12′	123	2.6
	5567	23 June 66	V	Boca Chica, Fla.	24°34′	81°42′	129	1.4
J #5571-5580	5573	15 Feb. 69	V	Long Key, Fla.	24°49′	80°47′	1097	*
14 Feb.	5574	22 May 66	V	Miami, Fla.	25°55′	80°06′	97	3.3
	5576	16 Dec. 66	V	Boot Key, Fla.	24°41′	81°06′	305	0.7
K #5581-5590	5585	30 Mar. 66	V	Jupiter, Fla.	26°57′	80°05′	44	8.8
14 Feb.	5586	8 Apr. 66	V	Miami, Fla.	25°48′	80°08′	53	6.0
	5587	30 Mar. 66	V	Juno Bch., Fla.	26°52′	80°05′	44	8.8
	5590	30 Mar. 66	V	Juno Bch., Fla.	26°52′	80°05′	44	8.8
L #5591-5600	5591	19 Mar. 66	V	Vero Bch., Fla.	27°38′	80°24′	32	13.6
15 Feb.	5592	12 Mar. 66	V	Ft. Pierce, Fla.	27°28′	80°18′	25	17.3
	5593	12 Mar. 66	V	Ft. Pierce, Fla.	27°28′	80°18′	25	17.3
	5599	18 Mar. 66	V	Vero Bch., Fla.	27°39′	80°21′	31	14.2

Cruise No. HC 24 (Continued) 7-15 February 1966

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
M #5601-5610	5601	17 Mar. 66	V	Ft. Pierce, Fla.	27°28′	80°18′	30	14.6
15 Feb.	5603	12 Mar. 66	V	Ft. Pierce, Fla.	27°28′	80°18′	25	17.3
	5605	16 Mar. 66	V	Biscayne Bay, Fla.	25°30′	80°16′	29	10.7
	5607	17 Mar. 66	V	Lantana, Fla.	26°35′	80°02′	30	12.6
	5609	26 June 66	V	Miami Bch., Fla.	25°48′	80°08′	131	2.5
	5610	10 Mar. 66	V	Palm Bch., Fla.	26°42′	80°03′	23	16.7
N #5611-5620	5614	24 Apr. 66	V	Vero Bch., Fla.	27°39′	80°21′	66	7.2
15 Feb.								
O #5621-5630	5621	3 Dec. 66	V	Rhodes Key, Fla.	25°22′	80°14′	291	1.2
15 Feb.								
P #5631-5640	5637	22 Apr. 66	V	Boynton Bch., Fla.	26°32′	80°03′	66	6.6
15 Feb.	5639	21 Feb. 71	V	Julia Is., Fla.	25°07′	80°23′	1832	*

Cruise No.: HC 25 3-22 March 1966

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #are not in	2522	6 Mar. 66	I	St. Pete. Bch., Fla.	27°43′	82°44′	3	3.1
consecutive	1009	5 Mar. 66	I	St. Pete. Bch., Fla.	27°43′	82°44′	2	4.7
order	2542	21 Mar. 66	I	Treasure Is., Fla.	27°46′	82°46′	18	0.7
3 Mar.	994	5 Mar. 66	I	St. Pete. Bch., Fla.	27°43′	82°44′	2	4.7
	2536	5 Mar. 66	I	St. Pete. Bch., Fla.	27°43′	82°44′	2	4.7
	993	5 Mar. 66	I	St. Pete. Bch., Fla.	27°43′	82°44′	2	4.7
	1008	5 Mar. 66	I	St. Pete. Bch., Fla.	27°43′	82°44′	2	4.7
B #are not in consecutive order 3 Mar.		No returns						
C #are not in consecutive order 3 Mar.		No returns						
D #are not in consecutive order 4 Mar.		No returns						

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Coordinates Long. W	Days Adrift	nmi/ day
E #are not in consecutive order 4 Mar.		No returns						
F #are not in consecutive order 5 Mar.	2524	7 Jan. 69	V	Stock Is., Key West, Fla.	24°34′	81°45′	1039	*
G #5641-5650 5 Mar.	5641	22 Apr. 66	V	Vero Bch., Fla.	27°34′	80°21′	48	9.4
	5642	17 Feb. 69	V	Boca Chica Bch., Fla.	24°34′	81°42′	1080	*
	5643	23 May 66	V	Marathon, Fla.	25°43′	81°06′	79	2.9
	5645	11 May 66	V	Boca Chica Bch., Fla.	24°34′	81°42′	67	3.0
	5647	10 June 66	V	Long Key, Fla.	24°49′	80°47′	97	2.6
	5649	31 May 66	V	Biscayne Bay, Fla.	25°30′	80°16′	87	3.9
H #5651-5660 5 Mar.	5651	6 Mar. 66	I	Captiva Is., Fla.	26°34′	82°13′	1	4.5
	5652	6 Mar. 66	I	Sanibel Is., Fla.	26°26′	82°02′	1	24.0
	5653	6 Mar. 66	I	Sanibel Is., Fla.	26°26′	82°02′	1	24.0
	5654	6 Mar. 66	I	Sanibel Is., Fla.	26°26′	82°02′	1	24.0
	5655	7 Mar. 66	I	Sanibel Is., Fla.	26°26′	82°02′	2	12.0
	5656	6 Mar. 66	I	Sanibel Is., Fla.	26°26′	82°02′	1	24.0
	5657	7 Mar. 66	I	Sanibel Is., Fla.	26°26′	82°02′	2	12.0
	5658	7 Mar. 66	I	Sanibel Is., Fla.	26°26′	82°02′	2	12.0
	5659	7 Mar. 66	I	Sanibel Is., Fla.	26°26′	82°02′	2	12.0
	5660	? May 66	I	Sanibel Is., Fla.	26°26′	82°02′	?	?
I #5661-5670 9 Mar.	5666	4 June 66	V	Grassy Key, Fla.	24°45′	80°57′	87	2.6
	5667	7 Jan. 69	V	Julia Is., Fla.	25°07′	80°23′	1035	*
J #5671-5680 9 Mar.	5671	4 June 66	V	St. Lucie, Fla.	27°09′	80°10′	87	4.6
	5672	27 May 66	V	Windley Key, Fla.	24°57′	80°36′	79	3.2
	5674	18 June 66	V	Miami Bch., Fla.	25°42′	80°15′	101	3.1
K #5681-5690 9 Mar.	5681	17 June 66	V	Dania, Fla.	26°03′	80°07′	100	3.4
	5685	28 June 66	V	Fernandina Bch., Fla.	30°42′	81°26′	111	5.7
	5686	20 May 66	V	Hallandale Bch., Fla.	25°59′	80°07′	72	4.6
L #5691-5700 22 Mar.		Released in April, 1966 – HC 26						
M #5701-5710 22 Mar.	5703	21 May 66	V	Key West, Fla.	24°33′	81°49′	60	3.2
	5704	6 June 66	V	Tavernier, Fla.	25°01′	80°31′	76	3.6
	5710	28 May 66	V	Key West, Fla.	24°33′	81°49′	67	2.9

Cruise No.: HC 25 (Continued) 3-22 March 1966

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
N #5711-5720 22 Mar.	5713	24 June 66	V	S Ponte Vedra Bch., Fla.	30°14′	81°23′	94	6.9
O #5721-5730 22 Mar.		No returns						
P #5731-5740 22 Mar.	5732	6 May 66	I	Sarasota Bay, Fla.	27°35′	82°37′	45	0.7
	5733	5 Apr. 66	I	Osprey, Fla.	27°12′	82°30′	14	2.1
	5734	14 Apr. 66	I	Siesta Key, Fla.	27°33′	82°45′	23	1.1
	5735	3 Apr. 66	I	Anna Maria Is., Fla.	27°29′	82°46′	12	0.8
	5737	5 Apr. 66	I	Osprey, Fla.	27°12′	82°30′	14	2.1
	5739	8 Apr. 66	I	Nokomis, Fla.	27°05′	82°30′	17	2.1
	5740	30 Nov. 66	I	Casey Key, Fla.	27°12′	82°51′	253	0.1

Cruise No.: HC 26 6-13 April 1966

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #5741-5750 6 Apr.	5741	20 May 66	III	Panama Bch., Fla.	30°14′	85°55′	44	5.1
	5742	9 Apr. 66	I	Anna Maria Is., Fla.	27°32′	82°45′	3	2.7
	5744	20 Aug. 67	II	Between Fish Creek & Hagons Cove, Fla.	29°46′	83°35′	501	*
	5746	13 Apr. 66	I	Anna Maria Is., Fla.	27°32′	82°44′	7	0.8
	5749	16 July 66	III	Panama City, Fla.	30°08′	85°50′	101	2.1
B #5751-5760 6 Apr.	5753	1 Aug. 66	III	Santa Rosa Is., Fla.	30°21′	86°40′	117	2.5
	5755	21 May 66	III	Panama City, Fla.	30°14′	85°55′	45	4.9
	5758	24 Nov. 66	V	Palm Bch., Fla.	26°42′	80°03′	232	1.1
C #5761-5770 6 Apr.	5761	10 Sept. 66	III	Between Pensacola & Ft. Pickens, Fla.	30°21′	87°11′	157	1.6
	5766	24 May 66	III	Santa Rosa Is., Fla.	30°12′	86°00′	48	4.9
	5768	10 July 66	III	Santa Rosa Is., Fla.	30°21′	87°04′	95	2.6
	5770	23 Aug. 66	III	Seagrove Bch., Fla.	30°23′	86°15′	139	1.6
D #5771-5780 7 Apr.	5772	20 Mar. 67	V	Miami Bch., Fla.	25°48′	80°08′	347	1.2
	5778	1 Feb. 67	V	Miami, Fla.	25°46′	80°08′	300	1.3
E #5781-5790 7 Apr.	5782	7 Mar. 69	V	Julia Is., Fla.	25°08′	80°22′	1065	*
	5784	17 July 66	V	Lauderdale-by-the-Sea, Fla.	26°09′	80°06′	101	4.3
	5785	15 June 66	V	Golden Bch., Fla.	25°59′	80°07′	69	6.1
	5787	28 June 66	V	Vero Bch., Fla.	27°39′	80°21′	82	6.4
	5790	26 July 66	V	Elliott Key, Fla.	25°26′	80°12′	110	3.5

Cruise No.: HC 26 (Continued) 6-13 April 1966

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
F #5791-5800	5793	7 Nov. 66	V	Wabasso, Fla.	27°46′	80°24′	213	2.3
8 Apr.	5796	20 Oct. 68	V	Old Rhodes Key, Fla.	25°22′	80°14′	926	*
G #5801-5810	5801	26 Mar. 67	V	Key West, Fla.	24°33′	81°47′	352	0.6
8 Apr.	5802	26 Feb. 67	V	Islamorada, Fla.	24°56′	80°37′	324	0.8
	5804	24 Nov. 66	V	Jupiter Is., Fla.	27°09′	80°09′	230	1.8
H #5811-5820	5813	15 Apr. 67	IV	Dauphin Is., Ala.	30°15′	88°13′	372	*
8 Apr.	5815	24 Nov. 66	V	Playalinda Bch., Fla.	28°36′	80°35′	230	2.2
	5816	23 Apr. 67	V	Islamorada, Fla.	24°56′	80°37′	380	*
	5818	10 Nov. 66	V	In surf off Pompano Bch., Fla.	26°10′	80°07′	216	1.6
	5819	20 Aug. 66	II	St. Geo. Is., Fla.	29°39′	84°53′	134	0.7
I #5821-5830	5821	12 Apr. 67	V	9 mi offshore Boca Raton, Fla.	26°21′	79°55′	366	*
11 Apr.	5823	18 Dec. 66	V	Palm Bch., Fla.	26°42′	80°03′	251	1.5
	5828	15 July 66	II	Cape San Blas, Fla.	29°40′	85°21′	95	2.7
	5929	12 Nov. 66	V	Jupiter Bch., Fla.	26°57′	80°05′	215	1.8
J #5831-5840	5831	13 Nov. 66	V	Hollywood Bch., Fla.	26°01′	80°02′	216	1.5
11 Apr.	5832	25 July 67	IV	Gilchrist Bch., Tex.	29°30′	94°30′	470	*
	5833	11 Sept. 66	II	Apalachicola, Fla.	29°39′	84°53′	153	1.6
	5835	21 Jan. 67	V	Lantana Bch., Fla.	26°35′	80°02′	285	1.3
	5840	2 June 66	II	Anclote Key, Fla.	28°12′	82°51′	52	2.1
K #5841-5850	5844	30 June 66	V	Satellite Bch., Fla.	28°10′	80°35′	80	5.9
11 Apr.	5849	16 Oct. 66	V	Key Largo, Fla.	25°08′	80°22′	188	1.5
L #5691-5700	5691	28 June 66	V	Jensen Bch., Fla.	27°15′	80°12′	77	5.4
12 Apr.	5696	8 June 66	V	Merritt Is., Fla.	28°22′	80°40′	57	8.6
	5698	2 Aug. 66	V	Key Largo, Fla.	25°11′	80°29′	112	2.5
	5700	19 June 66	V	Delray Bch., Fla.	26°28′	80°04′	68	5.4
M #5851-5860	5851	2 Jan. 71	V	Little Pine Key, Fla.	24°43′	81°18′	1726	*
12 Apr.	5853	5 June 66	V	Vero Bch., Fla.	27°33′	80°19′	54	8.2
	5855	20 July 66	V	Duck Key, Fla.	24°46′	80°55′	99	2.4
	5857	6 June 66	V	Sebastian Inlet, Fla.	27°59′	80°28′	55	8.4
N #5861-5870		No returns						
13 Apr.								
O #5871-5880	5872	22 May 66	III	Panama City Bch., Fla.	30°10′	85°48′	39	5.8
13 Apr.	5875	28 May 66	III	21 mi W of Panama City, Fla.	30°08′	86°10′	45	5.5

Cruise No.: HC 26 (Continued) 6-13 April 1966

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
O #5871-5880 13 Apr.	5876	13 July 66	V	Lower Matecumbe Key, Fla.	24°55′	80°39′	91	3.2
	5877	21 May 66	III	Tyndall AFB, Fla.	30°10′	85°48′	38	6.0
	5878	22 May 66	III	Panama City, Fla.	30°10′	85°48′	39	6.0
	5879	3 July 66	III	22 mi W of Panama City Bch., Fla.	30°08′	86°20′	81	3.0
P #5881-5890 13 Apr.	5884	23 Nov. 66	V	Indian Harbor Bch., Fla.	28°09′	80°35′	224	2.4
	5889	22 May 66	III	W Panama City Bch., Fla.	30°10′	85°48′	39	5.6

Cruise No.: HC 27 2-12 May 1966

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #5971-5980 2 May	5971	2 May 66	I	Egmont Key, Fla.	27°35′	82°45′	1	3.8
	5973	2 May 66	I	Egmont Key, Fla.	27°35′	82°45′	1	3.8
	5977	25 Sept. 66	II	Mexico Bch., Fla.	29°56′	85°23′	146	1.4
	5979	23 Aug. 66	III	Seagrove Bch., Fla.	30°18′	86°05′	113	2.1
	5980	2 May 66	I	Egmont Key, Fla.	27°35′	82°45′	1	3.8
B #5981-5990 2 May	5984	16 July 66	III	Panama City Bch., Fla.	30°08′	85°50′	75	2.8
	5986	18 May 67	V	Boca Raton, Fla.	26°21′	80°04′	381	*
C #5991-6000 2 May		No returns						
D #6001-6010 3 May		No returns						
E #6011-6020 3 May	6016	7 June 66	V	Cocoa Bch., Fla.	28°14′	80°36′	35	16.3
	6020	5 June 66	V	Cocoa Bch., Fla.	28°18′	80°36′	33	17.4
F #6021-6030 4 May	6028	4 Mar. 67	IV	Freeport, Tex.	28°57′	95°18′	304	2.2
G #6031-6040 4 May	6036	10 Nov. 66	V	Ft. Lauderdale, Fla.	26°07′	80°06′	190	1.9
H #6041-6050 4 May	6041	22 May 66	I	Anna Maria Is., Fla.	27°31′	82°41′	18	3.2
	6043	22 May 66	I	Holmes Bch., Fla.	27°28′	82°40′	18	3.2
	6044	16 Oct. 66	I	E Tampa Bay, Fla.	27°51′	82°24′	165	0.6
	6045	22 May 66	I	Holmes Bch., Fla.	27°28′	82°40′	18	3.2

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
H #6041-6050 4 May	6046	12 June 66	I	Rattlesnake Is., Tampa Bay, Fla.	27°41′	82°32′	39	2.2
	6048	11 June 66	I	Sunshine Skyway, St. Pete., Fla.	27°36′	82°36′	38	2.1
	6049	22 May 66	I	Anna Maria Is., Fla.	27°28′	82°43′	18	3.2
	6050	22 May 66	I	Anna Maria Is., Fla.	27°32′	82°45′	18	3.2
I #6051-6060 11 May	6052	22 May 66	I	Sanibel Is., Fla.	26°26′	82°10′	11	0.3
	6056	22 May 66	I	Sanibel Is., Fla.	26°26′	82°02′	11	0.5
	6058	28 May 66	I	Sanibel Is., Fla.	25°27′	82°01′	17	0.4
	6059	22 May 66	I	Sanibel Is., Fla.	26°26′	82°10′	11	0.3
	6060	22 May 66	I	Sanibel Is., Fla.	26°26′	82°02′	11	0.3
J #6061-6070 11 May	6062	26 May 66	I	Boca Grande Light, Fla.	26°43′	82°16′	15	1.5
	6063	30 May 66	I	Boca Grande Bch., Fla.	26°44′	82°16′	19	1.3
	6065	1 June 66	I	Charlotte Harbor, Fla.	26°45′	82°15′	21	1.2
	6067	24 May 66	I	Boca Grande, Fla.	26°46′	82°16′	13	1.8
K #6071-6080 11 May	6071	6 Nov. 66	V	Vero Bch., Fla.	27°39′	80°21′	179	2.4
L #6081-6090 12 May	6083	10 Nov. 66	V	S Ft. Pierce Inlet, Fla.	27°28′	80°18′	182	2.4
	6085	9 Oct. 66	V	Palm Bch., Fla.	26°42′	80°03′	150	2.5
	6088	5 Aug. 66	V	Tavernier, Fla.	25°01′	80°31′	85	3.1
	6090	5 Dec. 66	V	Delray Bch., Fla.	26°28′	80°04′	207	1.8
M #6091-6100 12 May	6091	15 Oct. 66	V	Delray Bch., Fla.	26°28′	80°04′	156	2.4
	6098	26 Aug. 66	V	Sugarloaf Key, Fla.	24°37′	81°31′	106	1.9
	6099	17 Nov. 66	V	Palm Bch., Fla.	26°42′	80°03′	189	2.0
	6100	10 Aug. 66	V	Key Largo, Fla.	25°11′	80°22′	90	3.2
N #6101-6110 12 May	6101	25 May 66	I	St. Pete. Bch., Fla.	27°42′	82°44′	13	3.7
	6102	26 May 66	I	St. Pete. Bch., Fla.	27°43′	82°45′	14	4.0
	6103	26 May 66	I	St. Pete. Bch., Fla.	27°43′	82°44′	14	3.6
	6104	26 May 66	I	St. Pete. Bch., Fla.	27°42′	82°44′	14	3.4
	6105	26 May 66	I	St. Pete. Bch., Fla.	27°43′	82°44′	14	3.4
	6106	28 May 66	I	St. Pete. Bch., Fla.	27°43′	82°44′	16	3.2
	6107	25 May 66	I	Pass-a-Grille, Fla.	27°42′	82°44′	13	3.7
	6108	26 May 66	I	St. Pete. Bch., Fla.	27°43′	82°44′	14	3.4
	6109	25 May 66	I	Pass-a-Grille, Fla.	27°42′	82°44′	13	3.7
	6110	26 May 66	I	St. Pete. Bch., Fla.	27°43′	82°44′	14	3.4
O #6111-6120 12 May	6111	4 June 66	I	Ruskin, Fla.	27°41′	82°32′	23	1.4
	6112	28 May 66	I	Mullet Key, Fla.	27°37′	82°44′	16	1.5
	6115	12 Aug. 66	I	Egmont Key, Fla.	27°35′	82°45′	92	0.2

Cruise No.: HC 27 (Continued) 2-12 May 1966

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
O #6111-6120	6117	24 May 66	I	St. Pete. Bch., Fla.	27°50′	82°50′	12	2.6
12 May	6118	25 May 66	I	Pass-a-Grille Bch., Fla.	27°42′	82°44′	13	2.1
	6120	25 May 66	I	Pass-a-Grille Bch., Fla.	27°42′	82°44′	13	2.1
P #6121-6130	6121	23 May 66	I	Treasure Is., Fla.	27°50′	82°50′	11	1.1
12 May	6123	23 May 66	I	Mullet Key, Fla.	27°41′	82°43′	11	0.5
	6124	22 May 66	I	St. Pete. Bch., Fla.	27°40′	82°45′	10	0.9
	6125	31 May 66	I	Tierra Verde, Fla.	27°41′	82°44′	19	0.5
	6128	20 May 66	I	Treasure Is., Fla.	27°50′	82°50′	8	1.5
	6129	22 May 66	I	Bunces Pass, St. Pete., Fla.	27°39′	82°43′	10	0.9
	6130	19 May 66	I	Treasure Is., Fla.	27°50′	82°50′	7	1.7

Cruise No.: HC 28 6-14 June 1966

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #6131-6140	6137	9 Apr. 67	IV	Galveston, Tex.	29°20′	94°46′	307	2.1
6 June								
B #6141-6150	6142	1 Oct. 66	II	St. Geo. Is., Fla.	29°39′	84°53′	117	1.3
6 June	6143	18 Nov. 66	V	Lake Worth, Fla.	26°37′	80°03′	165	2.7
	6150	23 Apr. 67	IV	Galveston, Tex.	29°15′	94°50′	321	2.0
C #6151-6160	6152	8 Feb. 67	C	Havana, Cuba	23°09′	82°22′	247	1.1+
6 June	6157	6 Aug. 66	V	Vaca Cut, Marathon, Fla.	24°44′	81°02′	61	4.8
D #6161-6170, 6179-6180	6167	6 Aug. 66	V	Vaca Cut, Marathon, Fla.	24°44′	81°02′	60	5.0
7 June	6170	18 Nov. 66	V	Hollywood, Fla.	26°01′	80°07′	164	2.6
E #6171-6178	6171	17 Oct. 66	V	Key West, Fla.	24°33′	81°46′	132	2.0
7 June	6174	16 Nov. 66	V	Lake Worth, Fla.	26°37′	80°03′	162	2.8
F #6181-6190	6182	22 Feb. 67	V	Sugarloaf Key, Fla.	24°37′	81°31′	260	0.9
7 June	6184	9 June 67	IV	Timbalier Bay, La.	29°08′	90°23′	367	*
	6187	11 Apr. 67	IV	High Is., Tex.	29°34′	94°27′	308	2.0
	6188	24 Mar. 67	V	Key Largo, Fla.	25°11′	80°22′	290	1.1
G #6191-6200	6194	17 Nov. 66	V	Deerfield Bch., Fla.	26°19′	80°04′	163	2.3
7 June	6199	16 Apr. 67	III	Gulf Shores, Ala.	30°15′	87°40′	313	1.1
	6200	7 May 67	IV	Holly Bch., La.	29°46′	93°27′	334	1.8
H #6201-6210	6201	13 June 66	I	Siesta Key, Fla.	27°17′	82°35′	6	8.0
7 June	6203	12 June 66	I	Sarasota, Fla.	27°19′	82°34′	5	9.0

Cruise No.: HC 28 (Continued) 6-14 June 1966

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
H #6201-6210	6204	11 June 66	I	Sarasota, Fla.	27°19′	82°34′	4	11.3
7 June	6205	11 June 66	I	Sarasota, Fla.	27°19′	82°34′	4	11.3
	6207	10 June 66	I	Lido Bch., Fla.	27°19′	82°34′	3	15.4
	6208	11 June 66	I	Siesta Key, Fla.	27°17′	82°35′	4	10.5
	6209	11 June 66	I	Siesta Key, Fla.	27°17′	82°35′	4	10.5
	6210	10 June 66	I	Lido Bch., Fla.	27°19′	82°34′	3	15.4
I #6211-6220	6211	30 Jan. 68	V	Playalinda Bch., Fla.	28°36′	80°35′	597	*
12 June	6212	2 July 66	I	Venice, Fla.	27°01′	82°25′	20	2.0
	6213	22 June 66	I	Knight Is., Fla.	26°53′	82°20′	10	3.6
	6214	22 June 66	I	Knight Is., Fla.	26°53′	82°20′	10	3.8
	6215	15 Sept. 66	I	Manasota Key, Fla.	26°59′	82°24′	95	0.4
	6216	31 July 66	I	Knight Is., Fla.	26°53′	82°20′	49	0.8
	6217	22 June 66	I	Knight Is., Fla.	26°53′	82°20′	10	3.8
	6218	1 July 66	I	Venice Public Bch., Fla.	27°07′	82°28′	19	2.7
	6219	1 July 66	I	Punta Gorda Bch., Fla.	26°55′	82°22′	19	2.2
	6220	21 June 66	I	Knight Is., Fla.	26°53′	82°20′	9	4.2
J #6221-6230	6229	19 Oct. 67	IV	Gilchrist, Tex.	29°30′	94°30′	494	*
12 June	6230	12 Aug. 68	V	Key Largo, Fla.	25°11′	80°22′	792	*
K #6231-6240	6231	18 Nov. 66	V	Jupiter Inlet, Fla.	26°57′	80°05′	159	2.5
12 June	6238	16 Dec. 66	V	Hollywood Bch., Fla.	26°01′	80°07′	187	1.8
L #6241-6250		No returns						
13 June								
M #6251-6260	6252	25 July 66	V	Boynton Bch., Fla.	26°32′	80°03′	42	9.0
13 June	6255	19 July 66	V	Jensen Bch., Fla.	27°15′	80°12′	36	11.8
N #6261-6270	6261	25 Sept. 66	V	Islamorada, Fla.	24°56′	80°37′	103	2.8
14 June	6262	17 Oct. 66	V	Miami Bch., Fla.	25°48′	80°08′	125	2.8
	6263	26 Nov. 66	V	Ft. Lauderdale, Fla.	26°07′	80°06′	165	2.3
	6266	5 Oct. 66	V	Coco Plum Bch., Fla.	24°44′	81°00′	113	2.3
	6267	17 Nov. 68	V	No Name Key, Fla.	24°41′	81°19′	887	*
O #6271-6280	6271	19 May 67	IV	Grand Chenier, La.	29°35′	92°46′	339	1.5
14 June	6276	26 Feb. 67	IV	Mouth of Rio Grande R., Tex.	25°58′	97°09′	257	2.9
P #6281-6290	6283	19 June 66	I	Clearwater Bch., Fla.	27°58′	82°54′	5	4.7
14 June	6287	18 Nov. 66	V	Satellite Bch., Fla.	28°08′	80°35′	157	3.4

Cruise No.: HC 29 2-7 July 1966

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #6291-6300	6291	8 July 66	I	Venice Jetties, Fla.	27°06′	82°30′	6	6.0
2 July	6292	7 July 66	I	Venice, Fla.	27°06′	82°29′	5	7.3
	6293	8 July 66	I	Venice, Fla.	27°06′	82°29′	6	6.1
	6294	31 July 66	I	Sarasota, Fla.	27°19′	82°35′	29	0.7
	6295	7 July 66	I	Venice, Fla.	27°06′	82°29′	5	7.3
	6296	7 July 66	I	Casey Key, Fla.	27°09′	82°29′	5	6.5
	6298	8 July 66	I	Venice, Fla.	26°41′	82°18′	6	7.3
	6299	16 Jan. 72	I	Casey Key, Fla.	27°12′	82°51′	2024	*
	6300	31 July 66	I	Sarasota Bay, Fla.	27°19′	82°35′	60	0.5
B #6301-6310	6308	24 Mar. 67	V	Geiger Key, Fla.	24°34′	81°39′	265	1.0
2 July								
C #6311-6320	6312	20 May 67	V	Cotton Key, Fla.	24°58′	80°37′	322	1.0
2 July	6314	20 Mar. 67	V	Cape Canaveral, Fla.	28°24′	80°36′	261	2.2
	6320	23 Feb. 67	V	Stock Is., Fla.	24°34′	81°45′	236	1.1
D #6321-6330	6329	17 Mar. 67	V	Key Biscayne, Fla.	25°48′	80°10′	258	1.5
3 July	6330	10 May 67	III	S Chandeleur Is., Miss.	29°52′	88°50′	312	1.0
E #6331-6340	6331	23 Nov. 66	V	Playalinda Bch., Fla.	28°35′	80°35′	143	4.2
3 July	6337	15 Oct. 66	V	Delray Bch., Fla.	26°28′	80°04′	104	4.3
F #6341-6350	6344	5 Apr. 67	IV	Galveston, Tex.	29°19′	94°47′	275	2.3
4 July	6346	22 Feb. 67	V	Islamorada, Fla.	24°56′	80°37′	233	1.2
	6349	24 Jan. 67	V	Delray Bch., Fla.	26°28′	80°00′	204	2.0
G #6351-6360	6352	15 Aug. 66	I	Holmes Bch., Fla.	27°30′	82°43′	42	1.1
4 July	6354	5 Oct. 67	V	Tavernier, Fla.	25°01′	80°31′	458	*
	6355	23 Jan. 67	V	Boca Chica Key, Fla.	24°34′	81°42′	203	1.0
	6356	7 Aug. 66	I	In pass between Longboat Key & Anna Maria Is., Fla.	27°27′	82°41′	34	1.4
	6357	7 Aug. 66	I	Anna Maria Is., Fla.	27°28′	82°42′	34	1.4
	6358	5 Aug. 66	I	Long Boat Key, Fla.	27°26′	82°41′	32	1.3
H #6361-6370	6362	20 Jan. 67	V	Delray Bch., Fla.	26°28′	80°04′	200	1.9
4 July	6363	17 Feb. 68	I	Long Boat Key, Fla.	27°23′	82°38′	593	*
	6366	12 Mar. 67	V	Tavernier, Fla.	25°01′	80°31′	251	1.1
	6367	5 Aug. 66	I	Siesta Key, Fla.	27°17′	82°35′	32	1.4
	6370	15 Aug. 66	I	Sarasota, Fla.	27°19′	82°35′	42	1.1
I #6371-6380	6372	3 Aug. 66	I	Manasota Key, Fla.	26°57′	82°23′	29	1.3
5 July	6373	31 July 66	I	Englewood Bch., Fla.	26°57′	82°23′	26	1.5
	6375	3 Aug. 66	I	Englewood Bch., Fla.	26°57′	82°23′	29	1.3

Cruise No.: 29 (Continued) 2-7 July 1966

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
I #6371-6380 5 July	6377	4 Aug. 66	I	Little Gasparilla Is., Fla.	26°45′	82°15′	30	1.0
	6378	4 Aug. 66	I	Casey Key, Fla.	27°09′	82°29′	30	2.0
J #6381-6390 5 July	6382	9 Aug. 66	I	Passage Key, Bradenton, Fla.	27°33′	82°44′	35	2.0
	6387	3 Mar. 67	V	Miami Bch., Fla.	25°48′	80°08′	241	1.3
K #6391-6400 5 July	6394	11 June 67	V	Key West, Fla.	24°34′	81°42′	341	0.5
	6400	8 Dec. 69	V	Key Largo, Fla.	25°07′	80°03′	1252	*
L #6401-6410 6 July	6405	3 Mar. 67	V	Delray Bch., Fla.	26°28′	80°04′	240	1.5
M #6411-6420 6 July	6412	4 Sept. 66	V	Angelfish Key, Fla.	25°20′	80°15′	60	5.0
	6417	11 Aug. 66	V	W Summerland Key, Fla.	24°40′	81°27′	36	5.8
	6419	26 July 67	V	Big Pine Key, Fla.	24°37′	81°21′	385	*
	6420	19 Aug. 66	V	Bahia Honda, Fla.	24°40′	81°16′	44	4.9
N #6421-6430 7 July	6422	26 Feb. 67	V	W Summerland Key, Fla.	24°40′	81°27′	234	1.0
	6423	15 Jan. 67	V	Marathon, Fla.	24°43′	81°06′	192	1.3
	6424	21 Feb. 67	V	Islamorada, Fla.	24°56′	80°37′	229	1.3
O #6431-6440 7 July	6431	21 Jan. 67	V	W Palm Bch., Fla.	26°42′	80°03′	198	2.2
	6434	20 Jan. 67	V	Lantana Bch., Fla.	26°35′	80°02′	197	2.1
	6440	9 Aug. 67	IV	Sandy Pt. (Tigre Pt.), La.	29°32′	92°15′	398	*
P #6441-6450 7 July	6442	13 Aug. 66	II	Tarpon Spr., Fla.	28°12′	82°51′	37	1.1
	6444	30 July 66	I	Dunedin Bch., Fla.	27°59′	82°50′	23	1.3
	6445	23 July 66	I	Clearwater, Fla.	27°58′	82°48′	16	1.6
	6446	22 July 66	I	Clearwater, Fla.	27°57′	82°49′	15	1.5
	6448	10 Sept. 66	II	Palm Harbor, Fla.	28°05′	82°47′	65	0.5
	6450	2 Aug. 66	II	Palm Harbor, Fla.	28°05′	82°47′	26	1.3

Cruise No.: HC 30 1-7 August 1966

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #6451-6460 1 Aug.	6453	3 Aug. 66	I	St. Pete. Bch., Fla.	27°43′	82°44′	2	5.1
	6454	3 Aug. 66	I	St. Pete. Bch., Fla.	27°43′	82°44′	2	5.1
	6456	3 Aug. 66	I	St. Pete. Bch., Fla.	27°43′	82°44′	2	5.1
	6458	3 Aug. 66	I	St. Pete. Bch., Fla.	27°43′	82°44′	2	5.1
	6459	3 Aug. 66	I	St. Pete. Bch., Fla.	27°43′	82°44′	2	5.1

Cruise No.: HC 30 (Continued) 1-7 August 1966

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
B #6461-6470	6464	20 July 69	V	Greyhound Key, Fla.	24°50′	80°48′	1084	*
1 Aug.	6465	18 Apr. 67	III	Dauphin Is., Ala.	30°15′	88°13′	260	1.2
	6470	18 Dec. 66	V	Boca Raton, Fla.	26°21′	80°04′	139	3.1
C #6471-6480	6471	12 Mar. 67	V	Delray Bch., Fla.	26°28′	80°04′	223	2.0
1 Aug.	6476	3 July 67	IV	Gilchrist, Tex.	29°30′	94°30′	336	1.8
	6477	24 Jan. 67	V	Marathon, Fla.	24°43′	81°06′	176	1.7
	6478	29 Jan. 67	V	Ragged Key #6, Fla.	25°33′	80°10′	181	2.1
D #6481-6490	6482	23 Jan. 67	V	Pompano Bch., Fla.	26°13′	80°05′	174	2.5
2 Aug.	6485	26 Feb. 67	V	Long Key, Fla.	24°49′	80°47′	208	1.5
	6487	6 Mar. 67	V	Delray Bch., Fla.	26°28′	80°00′	216	2.1
E #6491-6500	6491	3 Mar. 67	V	Sugarloaf Key, Fla.	24°37′	81°31′	213	1.3
2 Aug.	6493	24 Nov. 66	V	Lantana Bch., Fla.	26°35′	80°02′	114	4.0
	6499	2 Mar. 67	V	Golden Bch., Fla.	25°59′	80°07′	212	2.0
F #6501-6510	6501	26 Mar. 67	V	Sebastian, Fla.	27°51′	80°26′	235	2.1
3 Aug.	6503	16 Feb. 67	V	Valhalla Bch., Marathon, Fla.	24°43′	81°06′	197	1.3
	6508	26 Jan. 67	V	Miami, Fla.	25°43′	80°09′	176	2.0
	6509	10 July 67	V	Tavernier, Fla.	25°01′	80°31′	341	0.9
G #6511-6520	6512	22 Feb. 67	V	Marathon, Fla.	24°43′	81°06′	203	1.2
3 Aug.	6513	22 Oct. 67	V	Riviera Bch., Fla.	26°46′	80°02′	445	*
H #6521-6530	6521	17 Aug. 66	I	Sand Key, Fla.	26°41′	82°17′	14	0.4
3 Aug.	6523	19 Aug. 66	I	Lacosta Is., Fla.	26°42′	82°16′	16	0.3
	6525	21 Aug. 66	I	Lacosta Is., Fla.	26°42′	82°16′	18	0.3
	6526	11 Aug. 66	I	Lacosta Is., Fla.	26°42′	82°16′	8	0.6
	6527	11 Aug. 66	I	Lacosta Is., Fla.	26°42′	82°16′	8	0.6
	6528	11 Aug. 66	I	Lacosta Is., Fla.	26°42′	82°16′	8	0.6
I #6531-6540	6531	27 Aug. 66	II	Honeymoon Is., Fla.	28°04′	82°50′	22	5.6
5 Aug.	6532	7 Aug. 66	I	Captiva Is., Fla.	26°34′	82°13′	2	5.3
	6534	7 Aug. 66	I	Captiva Is., Fla.	26°34′	82°13′	2	5.3
	6535	7 Aug. 66	I	Sanibel Is., Fla.	26°26′	82°02′	2	5.3
	6536	7 Aug. 66	I	Sanibel Is., Fla.	26°26′	82°02′	2	5.3
	6538	7 Aug. 66	I	Captiva Is., Fla.	26°34′	82°13′	2	5.3
	6539	7 Oct. 66	I	Captiva Is., Fla.	26°34′	82°13′	63	0.2
	6540	7 Aug. 66	I	Captiva Is., Fla.	26°34′	82°13′	2	5.3
J #6541-6550	6547	24 Mar. 67	V	Hollywood, Fla.	26°01′	80°07′	231	1.4
5 Aug.								

Cruise No.: HC 30 (Continued) 1-7 August 1966

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
K #6551-6560 5 Aug.		No returns						
L #6561-6570	6563	2 Nov. 68	V	Big Pine Key, Fla.	24°37′	81°21′	819	*
6 Aug.	6565	4 Feb. 67	V	Elliott Key, Fla.	25°26′	80°11′	182	1.7
M #6571-6580	6572	22 Oct. 66	V	Juno Bch., Fla.	26°52′	80°05′	77	5.2
6 Aug.	6573	18 May 67	V	Miami Bch., Fla.	25°48′	80°08′	285	1.2
	6578	18 Nov. 66	V	Jensen Bch., Fla.	27°15′	80°12′	104	4.1
N #6581-6590	6583	16 Apr. 67	IV	Freeport, Tex.	28°57′	95°18′	252	2.6
7 Aug.	6587	20 Feb. 67	V	Grassy Key, Fla.	24°45′	80°57′	197	1.3
O #6591-6600	6596	27 Dec. 66	V	Boca Raton, Fla.	26°21′	80°04′	142	2.8
7 Aug.	6598	20 Sept. 67	V	Sebastian Inlet, Fla.	27°51′	80°26′	409	*
	6600	2 Apr. 67	V	Jupiter Is., Fla.	27°09′	80°09′	238	1.9
P #6601-6610 7 Aug.	6605	25 Jan. 69	V	Key Largo, Fla.	25°07′	80°23′	902	*

Cruise No.: HC 31 31 August-6 September 1966

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #6611-6620	6612	28 Sept. 66	II	Honeymoon Is., Fla.	28°06′	82°50′	28	1.1
31 Aug.	6614	15 Oct. 66	II	Ozona Shores, Fla.	28°04′	82°47′	45	0.8
	6615	30 Sept. 66	II	Tarpon Spr., Fla.	28°09′	82°48′	30	1.2
	6616	16 Sept. 66	I	Madeira Bch., Fla.	27°48′	82°48′	16	0.8
	6617	16 Sept. 66	I	N Redington Shores, Fla.	27°52′	82°51′	16	1.0
	6618	24 Sept. 66	II	Honeymoon Is., Fla.	28°05′	82°50′	24	1.3
	6620	26 Sept. 66	I	Belleair Bch., Fla.	27°57′	82°51′	26	0.8
B #6621-6630	6622	27 Jan. 67	V	Key Largo, Fla.	25°19′	80°16′	149	2.4
31 Aug.	6626	9 Apr. 68	V	Sugarloaf Key, Fla.	24°37′	81°31′	587	*
C #6631-6640	6637	23 Dec. 66	V	Ft. Lauderdale, Fla.	26°07′	80°06′	114	3.7
31 Aug.	6639	1 May 70	V	Key Largo, Fla.	25°07′	80°23′	1339	*
D #6641-6650	6641	21 Jan. 67	V	Miami Bch., Fla.	25°48′	80°08′	142	2.8
1 Sept.	6645	20 Jan. 67	V	Ft. Lauderdale, Fla.	26°07′	80°06′	141	3.0
	6647	13 Apr. 67	V	Long Key, Fla.	24°49′	80°47′	224	1.4
E #6651-6660	6655	12 Mar. 67	V	Coral Gables, Fla.	25°42′	80°15′	192	2.0
1 Sept.	6657	4 Aug. 67	V	Elliott Key, Fla.	25°29′	80°11′	337	1.1

Cruise No.: HC 31 (Continued) 31 August-6 September 1966

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
F #6661-6670 2 Sept.		No returns						
G #6671-6680 2 Sept.	6674	22 Oct. 66	I	Treasure Is., Fla.	27°46′	82°47′	50	0.5
	6677	1 Oct. 66	I	Indian Rocks Bch., Fla.	27°53′	82°52′	29	2.4
H #6681-6690 2 Sept.	6683	6 Sept. 66	I	Captiva Is., Fla.	26°28′	82°10′	4	2.4
	6685	8 Oct. 68	I	Placida, Fla.	26°50′	82°16′	767	*
	6688	4 Sept. 66	I	Captiva Pass, Fla.	26°36′	82°13′	2	1.2
	6689	15 Oct. 66	I	Boca Grande, Fla.	26°41′	82°16′	43	0.2
	6690	13 Oct. 69	I	Sanibel Is., Fla.	26°26′	82°02′	1168	*
I #6691-6700 4 Sept.	6691	20 Oct. 68	I	Lacosta Is., Fla.	26°39′	82°15′	777	*
	6693	21 Dec. 66	I	Gasparilla Is., Fla.	26°45′	82°15′	108	0.3
	6694	18 Sept. 66	I	Pine Is., Fla., half-way between Yorks Pt. & St. James City	26°30′	82°06′	14	0.9
	6695	12 Sept. 66	I	Sanibel Is., Fla.	26°08′	82°07′	8	1.6
	6696	10 Oct. 66	I	Gasparilla, Fla.	26°45′	82°15′	36	0.7
	6699	8 Sept. 66	I	Sanibel Is., Fla.	26°29′	82°08′	4	3.9
	6700	20 Sept. 66	I	Casey Key, Fla.	27°12′	82°51′	16	3.5
J #6701-6710 4 Sept.	6702	15 Sept. 67	V	Long Key, Fla.	24°49′	80°47′	376	*
	6706	17 Dec. 66	V	Palm Bch., Fla.	26°42′	80°03′	104	3.6
K #6711-6720 4 Sept.	6717	20 May 67	IV	Galveston, Tex.	29°13′	94°58′	258	2.6
	6718	16 Apr. 67	IV	Galveston, Tex.	29°13′	94°58′	224	3.0
L #6721-6730 5 Sept.	6722	9 Apr. 67	V	Plantation Key, Fla.	24°58′	80°33′	216	1.2
	6724	24 Mar. 67	IV	Padre Is., Tex.	27°51′	97°04′	200	3.8
	6725	20 May 69	IV	Padre Is., Tex.	27°00′	97°24′	988	*
M #6731-6740 5 Sept.		No returns						
N #6741-6750 6 Sept.	6746	19 Feb. 67	V	Key Largo, Fla.	25°19′	80°16′	166	2.0
	6748	12 Apr. 67	IV	Cameron, La.	29°47′	93°19′	218	2.6
	6749	15 Dec. 66	V	Islamorada, Fla.	24°56′	80°37′	100	2.9
O #6751-6760 6 Sept.	6752	15 Nov. 72	V	Boca Chica, Fla.	24°34′	81°42′	2262	*
	6753	20 Feb. 67	V	Looe Key, Fla.	24°33′	81°23′	167	1.5
	6757	17 Dec. 66	V	Dania Bch., Fla.	26°03′	80°07′	102	3.8
P #6761-6770 6 Sept.	6763	17 Dec. 66	V	Jupiter Is., Fla.	27°09′	80°09′	102	4.6
	6770	21 July 67	V	Coco Plum Bch., Fla.	24°44′	81°02′	318	0.9

Cruise No.: HC 32 8-14 October 1966

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #6771-6780	6772	18 Oct. 66	I	Egmont Key, Fla.	27°35′	82°45′	10	0.4
8 Oct.	6777	15 Oct. 66	I	Egmont Key, Fla.	27°35′	82°45′	7	0.5
B #6781-6790	6784	19 Dec. 66	V	Jupiter Is., Fla.	27°04′	80°07′	72	6.5
8 Oct.	6788	15 Feb. 67	V	Juno Bch., Fla.	26°52′	80°05′	130	3.5
	6789	1 Dec. 67	V	Key Largo Sound, Fla.	25°08′	80°23′	419	*
C #6791-6800	6792	17 Mar. 67	V	Key Largo, Fla.	25°08′	80°22′	160	2.2
8 Oct.	6796	30 Mar. 67	IV	Galveston, Tex.	29°20′	94°47′	173	3.6
	6798	16 Apr. 67	IV	Between Sargent and Matagorda, Tex.	28°15′	94°56′	190	3.5
D #6801-6810	6801	30 Mar. 67	V	Key Largo, Fla.	25°11′	80°22′	173	2.1
9 Oct.	6805	18 Sept. 67	IV	Galveston, Tex.	29°17′	94°48′	345	1.7
	6807	29 Nov. 67	V	Key Largo, Fla.	25°07′	80°23′	417	*
	6809	18 Feb. 67	V	Tavernier, Fla.	25°01′	80°31′	133	2.6
E #6811-6820	6814	21 Jan. 67	V	Miami, Fla.	25°43′	80°15′	104	3.9
9 Oct.	6816	4 Mar. 67	V	Miami, Fla.	25°47′	80°09′	146	2.8
F #6821-6830	6828	20 Mar. 67	V	Jupiter Is., Fla.	27°09′	80°09′	161	2.4
10 Oct.								
G #6831-6840	6836	17 Dec. 66	V	Cape Fla. (Coral Gables), Fla.	25°40′	80°10′	68	4.9
10 Oct.	6838	5 Feb. 68	V	Key Largo Sound, Fla.	25°08′	80°23′	483	*
H #6841-6850	6849	2 Feb. 70	V	Stuart, Fla.	27°12′	80°15′	1211	*
10 Oct.								
I #6851-6860	6858	15 Jan. 67	V	Islamorada, Fla.	24°56′	80°37′	95	2.7
12 Oct.	6859	27 Dec. 66	V	Palm Beach, Fla.	26°42′	80°03′	76	5.0
J #6861-6870	6861	19 Dec. 66	V	Jupiter Is., Fla.	27°09′	80°09′	68	5.7
12 Oct.	6867	21 Dec. 66	V	Islamorada, Fla.	24°57′	80°37′	70	3.5
K #6871-6880	6872	5 Dec. 67	V	N Key Largo, Fla.	25°19′	80°16′	419	*
12 Oct.	6880	10 Dec. 66	V	Key West, Fla.	24°33′	81°46′	59	3.1
L #6881-6890	6885	19 Mar. 67	M	35 mi S of Rio Grande R., Mex.	25°23′	97°09′	157	4.8+
13 Oct.								
M #6891-6900		No returns						
13 Oct.								

Cruise No.: HC 32 (Continued) 8-14 October 1966

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
N #6901-6910 14 Oct.	6904	19 Dec. 66	V	Jupiter, Fla.	26°56′	80°04′	66	6.5
O #6911-6920 14 Oct.	6914	28 Oct. 67	N	N Uist, Outer Hebrides, Scotland	57°40′	07°50′	379	*+
P #6921-6930 14 Oct.	6922	30 Apr. 67	IV	Grand Is., La.	29°14′	90°00′	198	0.8

Cruise No.: HC 33 6-14 November 1966

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #6931-6940	6931	27 Nov. 66	I	Egmont Key, Fla.	27°35′	82°45′	21	0.2
6 Nov.	6933	12 Nov. 66	I	Egmont Key, Fla.	27°35′	82°45′	6	0.6
	6935	22 Mar. 69	I	Egmont Key, Fla.	27°35′	82°45′	867	*
	6937	14 Nov. 66	I	Egmont Key, Fla.	27°35′	82°45′	8	0.5
	6938	2 Apr. 67	I	Egmont Key, Fla.	27°35′	82°45′	147	0.03
	6940	27 Nov. 66	I	Egmont Key, Fla.	27°35′	82°45′	21	0.2
B #6941-6950	6941	2 Jan. 67	V	Miami, Fla.	25°44′	80°09′	57	6.8
6 Nov.	6943	23 Jan. 67	V	Ft. Lauderdale, Fla.	26°07′	80°06′	78	5.3
	6945	7 Nov. 67	V	Big Pine Key, Fla.	24°37′	81°21′	366	*
C #6951-6960	6954	17 Dec. 66	V	Ft. Lauderdale, Fla.	26°07′	80°06′	41	10.2
6 Nov.	6956	7 Mar. 67	V	Key West, Fla.	24°33′	81°46′	121	2.1
	6957	18 Dec. 66	V	Boca Raton, Fla.	26°21′	80°04′	42	10.3
	6958	25 Dec. 66	V	Ft. Lauderdale, Fla.	26°08′	80°06′	49	8.6
	6959	8 June 67	V	Miami, Fla.	25°42′	80°16′	214	2.0
	6960	16 Dec. 66	V	Duck Key, Fla.	24°46′	80°55′	40	7.6
D #6961-6970	6961	16 Dec. 66	V	Hollywood Bch., Fla.	26°01′	80°07′	37	11.3
9 Nov.	6962	17 Dec. 66	V	Hutchinson Is., Fla.	27°23′	80°15′	38	13.2
	6963	12 Dec. 66	V	Tavernier, Fla.	25°01′	80°31′	33	10.5
	6964	18 Dec. 66	V	Ft. Lauderdale, Fla.	26°07′	80°06′	39	10.9
	6965	14 Oct. 67	V	Money Key, Fla.	24°41′	81°13′	339	0.9
E #6971-6980	6971	27 Feb. 67	V	Key Largo, Fla.	25°11′	80°22′	110	3.4
9 Nov.	6972	14 Apr. 67	V	Satellite Bch., Fla.	28°10′	80°35′	156	3.6
F #6981-6990 10 Nov.		No returns						

Cruise No.: HC 33 (Continued) 6-14 November 1966

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Coordinates Long. W	Days Adrift	nmi/ day
G #6991-7000 10 Nov.		No returns						
H #9001-9010 10 Nov.		No returns						
I #9011-9020 12 Nov.		No returns						
J #9021-9030 12 Nov.		No returns						
K #9031-9040	9034	3 July 67	V	Elliott Key, Fla.	25°26′	80°12′	233	1.3
12 Nov.	9036	7 Dec. 66	V	Pompano Bch., Fla.	26°13′	80°05′	25	13.9
	9037	4 July 67	V	Old Rhodes Key, Fla.	25°22′	80°14′	234	1.3
	9040	9 Dec. 66	V	Juno Bch., Fla.	26°52′	80°05′	27	14.5
L #9041-9050	9041	17 Dec. 66	V	Boca Raton, Fla.	26°22′	80°04′	34	10.6
13 Nov.	9042	23 Jan. 67	V	Miami Bch., Fla.	25°48′	80°08′	71	4.5
	9043	11 Feb. 67	V	Duck Key, Fla.	24°46′	80°55′	90	2.6
	9046	28 Dec. 66	V	Hallandale, Fla.	25°59′	80°07′	45	7.5
	9047	25 Oct. 67	V	Key Largo, Fla.	25°11′	80°22′	346	0.8
M #9051-9060	9051	18 Dec. 66	V	Highland Bch., Fla.	26°25′	80°04′	35	10.6
13 Nov.	9060	11 Dec. 66	V	Dove Key, Fla.	25°03′	80°29′	28	9.9
N #9061-9070	9067	1 Jan. 67	V	Key Largo, Fla.	25°11′	80°22′	48	6.6
14 Nov.	9069	26 Mar. 67	V	Miami, Fla.	25°47′	80°12′	132	2.7
O #9071-9080	9072	13 Apr. 67	V	Hollywood Bch., Fla.	26°01′	80°07′	150	2.6
14 Nov.	9074	24 Jan. 67	V	Big Pine Key, Fla.	24°37′	81°21′	71	3.6
	9075	7 Jan. 67	V	Ft. Lauderdale, Fla.	26°05′	80°07′	54	7.3
	9078	9 July 68	V	Tavernier, Fla.	25°01′	80°31′	603	*
	9080	15 Feb. 70	V	Julia Is., Fla.	25°07′	80°23′	1189	*
P #9081-9090	9083	23 Jan. 67	V	Miami Bch., Fla.	25°48′	80°08′	70	5.5
14 Nov.	9089	16 May 70	V	Key Largo, Fla.	25°11′	80°22′	1279	*

Cruise No.: HC 34 1-8 December 1966

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #9091-9100 1 Dec.	9095	14 Feb. 67	V	Ft. Lauderdale, Fla.	26°07′	80°06′	75	5.5
B #9101-9110 1 Dec.	9105	28 Mar. 67	V	Key Largo, Fla.	25°05′	80°26′	117	2.9
	9106	18 Feb. 67	V	Miami Bch., Fla.	25°48′	80°08′	79	4.9
	9108	17 Mar. 67	V	Riviera Bch., Fla.	26°46′	80°02′	106	4.2
C #9111-9120 1 Dec.	9116	19 Mar. 67	V	Miami, Fla.	25°48′	80°08′	108	3.7
	9119	20 Mar. 67	V	Woman Key, Fla.	24°31′	81°58′	109	1.8
D #9121-9130 2 Dec.	9122	14 Oct. 68	V	Lower Matecumbe Key, Fla.	24°51′	80°44′	682	*
	9126	9 Aug. 68	V	Elliott Key, Fla.	25°26′	80°12′	616	*
	9127	24 Mar. 67	V	Key Largo, Fla.	25°11′	80°22′	112	3.2
E #9131-9140 2 Dec.	9137	21 Feb. 68	V	Miami, Fla.	25°47′	80°12′	446	*
	9138	13 Sept. 67	V	Juno Bch., Fla.	26°52′	80°05′	285	1.7
F #9141-9150 3 Dec.	9141	5 Jan. 70	V	Julia Is., Fla.	25°18′	80°22′	1129	*
	9143	25 June 67	V	Key West, Fla.	24°33′	81°46′	204	1.1
	9144	16 Feb. 67	V	Biscayne Key, Fla.	25°41′	80°10′	75	4.7
	9146	5 Apr. 67	V	Jupiter Is., Fla.	26°57′	80°05′	123	3.5
	9147	29 June 67	II	St. Geo. Is., Fla.	29°39′	84°53′	208	0.9
	9148	23 Jan. 67	V	Hutchinson Is., Fla.	27°15′	80°12′	51	8.8
G #9151-9160 3 Dec.	9154	20 Mar. 67	V	Dania Bch., Fla.	26°03′	80°07′	107	3.3
	9156	1 Apr. 67	V	Hobe Sound, Fla.	27°04′	80°07′	119	3.5
	9157	21 Feb. 67	V	Miami Bch., Fla.	25°48′	80°08′	80	4.2
H #9161-9170 3 Dec.		No returns						
I #9171-9180 6 Dec.	9174	21 June 67	IV	Sabine Pass, Tex.	29°38′	94°10′	197	3.4
	9176	1 Feb. 67	V	Dania Bch., Fla.	26°03′	80°07′	57	6.0
	9179	12 Feb. 67	V	Elliott Key, Fla.	25°26′	80°12′	68	4.4
J #9181-9190 6 Dec.	9182	9 Apr. 67	V	Miami Bch., Fla.	25°48′	80°08′	124	2.5
	9185	24 Mar. 67	V	Wabasso Bch., Fla.	27°46′	80°24′	108	4.1
	9189	11 Mar. 67	V	Boca Raton, Fla.	26°21′	80°04′	95	3.7
K #9191-9200 6 Dec.	9192	18 Mar. 67	V	Miami, Fla.	25°47′	80°12′	102	3.1
	9194	31 Mar. 67	V	Ormond Bch., Fla.	29°17′	81°02′	115	4.8
	9199	20 Mar. 67	V	Miami Bch., Fla.	25°48′	80°08′	104	3.0
	9200	14 Feb. 67	V	Boynton Bch., Fla.	26°32′	80°03′	70	5.2

Cruise No.: HC 34 (Continued) 1-8 December 1966

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
L #9201-9210 7 Dec.	9202	28 Jan. 67	V	Coco Plum Bch., Fla.	24°44′	81°02′	52	4.3
	9203	22 Jan. 67	V	Ft. Lauderdale, Fla.	26°07′	80°06′	46	7.6
	9204	2 Feb. 67	V	Caesar's Creek, Fla.	25°23′	80°14′	57	5.2
	9205	19 Mar. 67	V	Hollywood Bch., Fla.	26°01′	80°07′	102	3.3
	9208	27 Jan. 67	V	Miami Bch., Fla.	25°48′	80°08′	51	6.3
	9209	31 Jan. 67	V	Hallandale, Fla.	25°59′	80°07′	55	6.2
	9210	15 July 67	I	E Cape Sable, Fla.	25°07′	81°05′	220	0.7
M #9211-9220 7 Dec.	9212	28 Feb. 67	V	Key Biscayne, Fla.	25°43′	80°09′	83	4.0
	9213	21 Jan. 67	V	Grassy Key, Fla.	24°45′	80°57′	45	5.2
	9217	6 Apr. 69	V	Key Largo, Fla.	25°11′	80°22′	851	*
	9218	7 Mar. 67	V	Julia Is., Fla.	25°07′	80°23′	90	3.2
N #9221-9230 8 Dec.	9226	7 Nov. 67	V	Big Pine Key, Fla.	24°37′	81°21′	334	0.7
	9229	19 Mar. 67	V	Tavernier, Fla.	25°01′	80°31′	101	3.0
O #9231-9240 8 Dec.	9231	27 Sept. 67	V	Marathon, Fla.	24°43′	81°06′	293	0.9
	9238	19 Feb. 68	V	Ramrod Key, Fla.	24°39′	81°25′	438	*
	9239	2 Feb. 67	V	Pompano Bch., Fla.	26°13′	80°05′	56	7.2
P #9241-9250 8 Dec.	9245	24 Mar. 67	V	Jupiter, Fla.	26°57′	80°05′	106	4.3

Cruise No.: HC 35 6-14 January 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #9251-9260 6 Jan.	9251	5 Apr. 67	V	Julia Is., Fla.	25°07′	80°23′	89	3.9
	9255	7 Jan. 67	I	Egmont Key, Fla.	27°35′	82°45′	1	3.8
	9256	10 Jan. 67	I	Clearwater, Fla.	27°55′	82°59′	4	5.4
B #9261-9270 6 Jan.	9262	5 Mar. 67	V	Lower Matecumbe Key, Fla.	24°52′	80°43′	58	5.2
	9264	26 Mar. 67	V	S Miami Bch., Fla.	25°46′	80°08′	79	4.9
C #9271-9280 6 Jan.	9272	17 Mar. 67	V	Golden Bch., Fla.	25°59′	80°07′	70	5.9
	9274	7 Mar. 67	V	Islamorada, Fla.	24°56′	80°37′	60	5.4
	9275	22 Feb. 69	V	Ft. Lauderdale, Fla.	26°07′	80°06′	778	*
	9277	19 Mar. 67	V	Palm Bch., Fla.	26°42′	80°03′	72	6.3
	9279	20 Mar. 67	V	Boynton Bch., Fla.	26°32′	80°03′	73	6.1

Cruise No.: HC 35 (Continued) 6-14 January 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Coordinates Long. W	Days Adrift	nmi/ day
D #9281-9290	9286	7 Mar. 67	V	Miami, Fla.	25°47′	80°12′	59	6.8
7 Jan.	9289	3 Mar. 67	V	N Palm Bch., Fla.	26°51′	80°03′	55	8.4
E #9291-9300		Not released						
7 Jan.								
F #9301-9310	9304	6 Mar. 67	V	Islamorada, Fla.	24°56′	80°37′	58	5.0
7 Jan.	9308	29 Mar. 67	V	S Melbourne Bch., Fla.	28°04′	80°03′	81	6.2
	9309	9 Apr. 67	V	S Delray Bch., Fla.	26°28′	80°04′	92	4.4
	9310	6 Apr. 67	V	Manalapan, Fla.	26°34′	80°02′	89	4.6
G #9311-9320		No returns						
7 Jan.								
H #9321-9330		No returns						
7 Jan.								
I #9331-9340	9331	16 Feb. 67	V	Miami Bch., Fla.	25°48′	80°08′	33	9.7
12 Jan.	9340	14 Feb. 67	V	Islamorada, Fla.	24°56′	80°37′	35	7.2
J # 9341-9350		No returns						
12 Jan.								
K #9351-9360	9359	15 Feb. 67	V	Boynton Bch., Fla.	26°32′	81°03′	34	10.7
12 Jan.								
L #9361-9370	9361	1 Aug. 68	V	N Julia Is., Fla.	25°10′	80°22′	566	*
13 Jan.	9363	22 Mar. 67	V	Miami, Fla.	25°42′	80°13′	68	4.7
	9364	19 Mar. 67	V	Delray Bch., Fla.	26°28′	80°04′	65	5.7
	9368	13 Apr. 68	V	Palm Bch., Fla.	26°42′	80°03′	456	*
	9369	13 Apr. 67	V	N Miami Bch., Fla.	25°56′	80°07′	90	3.7
M #9371-9380	9372	12 Apr. 67	V	Cape Kennedy, Fla.	28°23′	80°36′	89	5.6
13 Jan.	9374	19 Mar. 67	V	Delray Bch., Fla.	26°28′	80°04′	65	5.7
	9375	18 June 67	V	Boca Chica, Fla.	24°34′	81°42′	156	1.3
	9376	3 Apr. 67	V	Boca Raton, Fla.	26°20′	80°04′	80	4.6
N #9381-9390	9390	12 Nov. 67	V	Jupiter Is., Fla.	26°56′	80°04′	302	1.4
14 Jan.								
O #9391-9400	9391	19 Mar. 67	V	Little Torch Key, Fla.	24°38′	81°24′	64	4.0
14 Jan.	9394	16 Mar. 67	V	Tavernier, Fla.	25°01′	80°31′	61	5.2
	9395	5 Mar. 67	V	N Key Largo, Fla.	25°02′	80°29′	50	6.8
	9397	3 Nov. 67	V	Key Largo, Fla.	25°19′	80°16′	293	1.1

Cruise No.: HC 35 (Continued) 6-14 January 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
P #9401-9410	9402	23 Feb. 67	V	Delray Bch., Fla.	26°28′	80°04′	40	10.8
14 Jan.	9403	22 Feb. 67	V	Palm Bch., Fla.	26°42′	80°03′	39	11.3
	9408	17 June 67	V	Elliott Key, Fla.	25°26′	80°11′	154	2.4
	9409	14 Jan. 69	V	Key Largo, Fla.	25°11′	80°22′	731	*
	9410	26 Feb.67	V	Long Key, Fla.	24°49′	80°47′	43	7.0

Cruise No.: HC 36 5-16 February 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #9411-9420	9414	26 Mar. 67	V	Hallandale, Fla.	25°59′	80°07′	49	8.2
5 Feb.	9416	23 July 70	V	Miami, Fla.	25°47′	80°10′	1264	*
	9417	17 May 67	V	Lower Matecumbe Key, Fla.	24°52′	80°43′	101	3.0
	9418	15 May 67	V	Jap Rock, Delray Bch., (3 mi S) Fla.	26°28′	80°04′	99	4.3
B #9421-9430	9422	15 Feb. 70	V	N Key Largo, Fla.	25°19′	80°16′	1106	*
5 Feb.	9423	3 Apr. 67	V	Lignum Vitae Key, Fla.	24°54′	80°42′	57	5.6
	9424	18 Mar. 67	V	Elliott Key, Fla.	25°26′	80°12′	41	9.0
	9426	31 Mar. 67	V	Plantation Key, Fla.	24°58′	80°33′	54	6.1
	9428	30 Apr. 67	V	Plantation Key, Fla.	24°58′	80°33′	84	3.9
	9429	14 June 67	V	Key Largo, Fla.	25°11′	80°22′	129	2.7
	9430	25 Mar. 67	V	Marathon, Fla.	24°43′	81°06′	48	6.0
C #9431-9440	9433	10 Mar. 67	V	Matecumbe, Fla.	24°55′	80°39′	33	9.9
5 Feb.	9436	27 Mar. 67	V	Cocoa Bch., Fla.	28°18′	80°36′	50	11.2
	9438	17 Apr. 67	V	Lower Matecumbe Key, Fla.	24°52′	80°43′	71	4.5
	9439	1 Apr. 67	V	Hallandale Bch., Fla.	25°59′	80°07′	55	7.5
D #9441-9450	9441	8 Aug. 67	V	Elliott Key, Fla.	25°26′	80°11′	183	2.1
6 Feb.	9448	26 Oct. 68	V	Elliott Key, Fla.	25°29′	80°11′	628	*
E #9451-9460	9455	25 Mar. 67	V	Hillsboro Bch., Fla.	26°19′	80°04′	47	9.4
6 Feb.	9458	4 Nov. 67	V	Boca Chica Key, Fla.	24°36′	81°43′	271	1.0
F #9461-9470	9461	15 Mar. 67	V	Big Pine Key, Fla.	24°39′	81°20′	36	6.6
7 Jan.	9467	10 Mar. 68	V	Lower Matecumbe Key, Fla.	24°52′	80°43′	397	*
	9468	17 Mar. 67	V	Ft. Lauderdale, Fla.	26°07′	80°06′	38	10.0
	9469	16 Mar. 67	V	Tavernier, Fla.	25°01′	80°31′	37	8.1

Cruise No.: HC 36 (Continued) 5-16 February 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Coordinates Long. W	Days Adrift	nmi/ day
G #9471-9480	9475	10 Apr. 67	V	Ft. Lauderdale, Fla.	26°07′	80°06′	62	5.8
7 Feb.	9477	31 Mar. 67	V	Ft. Pierce, Fla.	27°15′	80°12′	52	8.3
	9478	8 Apr. 67	V	Elliott Key, Fla.	25°26′	80°12′	60	5.3
	9479	30 Mar. 67	V	Miami Bch., Fla.	25°48′	80°08′	52	6.5
H #9481-9490	9481	21 Apr. 67	V	Delray Bch., Fla.	26°28′	80°04′	73	5.1
7 Feb.	9484	14 Apr. 67	V	Coral Gables, Fla.	25°42′	80°15′	66	4.9
	9487	14 Apr. 67	V	Miami Bch., Fla.	25°48′	80°08′	66	5.0
	9490	14 Apr. 67	V	Miami Bch., Fla.	25°48′	80°08′	66	5.0
I #9491-9500	9495	17 Apr. 67	V	Key West, Fla.	24°33′	81°46′	61	3.0
15 Feb.								
J #9501-9510	9502	16 Apr. 67	V	Key West, Fla.	24°33′	81°46′	60	3.0
15 Feb.	9505	22 Oct. 67	V	Ft. Pierce, Fla.	27°28′	80°18′	249	1.7
K #9511-9520	9511	17 Sept. 67	V	Sugarloaf Key, Fla.	24°37′	81°31′	214	0.9
15 Feb.	9512	25 Mar. 67	V	Greyhound Key, Fla.	24°50′	80°48′	38	6.2
	9514	5 May 67	V	Key West, Fla.	24°33′	81°46′	79	2.3
	9515	25 July 67	V	Tavernier, Fla.	25°01′	80°31′	160	1.6
	9517	16 July 67	V	Elliott Key, Fla.	25°26′	80°12′	151	2.0
	9520	26 Mar. 67	V	Bahia Honda, Fla.	24°40′	81°16′	39	5.2
L #9521-9530	9521	6 Mar. 67	V	Miami Bch., Fla.	25°48′	80°08′	18	17.9
16 Feb.	9523	5 Mar. 67	V	Miami Bch., Fla.	25°46′	80°08′	17	19.0
	9525	5 Mar. 67	V	Lauderdale-by-the-Sea, Fla.	26°09′	80°06′	17	20.5
	9526	31 May 70	V	Fat Deer Key, Fla.	24°15′	81°00′	1247	*
	9527	11 Mar. 67	V	Pennekamp Park, Key Largo, Fla.	25°08′	80°22′	23	12.3
	9529	10 Mar. 67	V	Bahia Honda, Fla.	24°40′	81°16′	22	9.5
M #9531-9540	9531	12 June 67	V	Big Coppit Key, Fla.	24°36′	81°40′	116	1.7
16 Feb.	9532	31 Oct. 67	V	Grassy Key, Fla.	24°45′	84°57′	257	0.9
	9537	20 Mar. 67	V	Hollywood Bch., Fla.	26°01′	80°07′	32	10.8
	9539	27 Mar. 67	V	Bahia Honda, Fla.	24°40′	81°16′	39	5.5
N #9541-9550	9543	31 Mar. 67	V	Hollywood Bch., Fla.	26°01′	80°07′	43	8.7
16 Feb.	9544	2 June 67	V	Niles Channel, Fla.	24°39′	81°26′	106	2.2
	9547	27 Mar. 67	V	Highland Bch., Fla.	26°25′	80°04′	39	10.2
	9549	22 Aug. 67	N	Heist, Belgium	51°30′	03°20′E	187	27.1+
	9550	2 Apr. 67	V	Lignum Vitae Key, Fla.	24°54′	80°42′	45	6.3

Cruise No.: HC 36 (Continued) 5-16 February 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
O #9551-9560	9551	26 Apr. 68	V	N Key Largo, Fla.	25°19′	80°16′	435	*
16 Feb.	9553	13 Apr. 67	V	Hutchinson Is., Fla.	27°13′	80°10′	56	8.2
	9556	15 Jan. 69	V	Miami, Fla.	25°54′	80°08′	699	*
P #9561-9570	9561	14 Apr. 67	V	Hollywood Bch., Fla.	26°01′	80°07′	57	7.1
16 Feb.	9562	13 June 67	V	St. Augustine, Fla.	29°54′	81°18′	117	5.6
	9565	11 May 67	V	Lantana Bch., Fla.	26°35′	80°02′	84	5.2
	9569	2 Apr. 67	V	Cocoa Bch., Fla.	28°18′	80°36′	45	12.3
	9570	29 July 67	V	Archer Key, Fla.	24°34′	81°53′	163	1.1

Cruise No.: HC 37 2-10 March 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #9571-9580	9572	19 June 67	V	N Key Largo, Fla.	25°19′	80°16′	109	3.3
2 Mar.	9573	1 Aug. 67	V	Key Largo, Fla.	25°11′	80°22′	152	2.3
	9574	22 July 69	V	Long Key, Fla.	24°49′	80°48′	873	*
	9576	14 Aug. 67	V	Big Pine Key, Fla.	24°37′	81°21′	165	1.6
	9579	5 Oct. 67	V	Crescent Bch., Fla.	29°46′	81°15′	217	3.0
B #9581-9590	9583	31 July 67	V	N Miami Bch., Fla.	25°56′	80°04′	151	2.6
2 Mar.	9585	4 July 67	V	Boca Chica Key, Fla.	24°34′	81°42′	124	2.1
	9589	23 Apr. 67	V	Miami, Fla.	25°47′	80°10′	52	7.4
C #9591-9600	9591	12 June 67	V	W Summerland Key, Fla.	24°40′	81°27′	102	2.7
2 Mar.	9595	30 Apr. 67	V	Long Key, Fla.	24°49′	80°47′	59	5.2
	9600	20 Apr. 67	V	Delray Bch., Fla.	26°28′	80°04′	49	9.0
D #9601-9610	9605	18 July 70	V	Key Largo, Fla.	25°05′	80°27′	1233	*
3 Mar.	9609	19 May 67	V	Delray Bch., Fla.	26°28′	80°04′	77	5.8
E #9621-9630	9621	11 June 67	N	Wrightsville Bch., N.C.	34°13′	77°47′	100	10.0+
3 Mar.	9624	15 Sept. 67	II	St. Geo. Is., Fla.	29°36′	85°04′	196	0.7
	9625	27 Mar. 67	V	Palm Bch., Fla.	26°42′	80°03′	24	19.3
	9627	27 Mar. 67	V	Lake Worth, Fla.	26°37′	80°03′	24	19.1
	9628	13 May 67	III	Tyndall AFB, Fla.	30°05′	85°38′	71	2.5
	9629	13 Apr. 67	V	Key West, Fla.	24°33′	81°48′	41	6.6
F #9671-9680	9674	21 Apr. 67	V	Boynton Bch., Fla.	26°32′	80°03′	48	8.4
4 Mar.	9679	23 Apr. 67	V	Boca Chica Key, Fla.	24°34′	81°42′	50	4.4

Cruise No.: HC 37 (Continued) 2-10 March 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
G #9681-9690 4 Mar.	9686	30 May 68	IV	Houston, Tex.	28°27′	96°24′	453	*
H #9691-9700 4 Mar.	9691	7 Mar. 67	I	N Englewood Bch., Fla.	26°58′	82°23′	3	7.6
	9692	8 Mar. 67	I	N Englewood Bch., Fla.	26°58′	82°23′	4	5.7
	9693	19 Mar. 67	I	Manasota (Lemon Bay), Fla.	26°57′	82°22′	15	1.4
	9694	7 Mar. 67	I	Manasota Key, Fla.	26°57′	82°23′	3	7.0
	9695	7 Mar. 67	I	S end Manasota Key (Lemon Bay), Fla.	26°54′	82°21′	3	5.9
	9696	22 Mar. 67	I	Boca Grande, Fla.	26°44′	82°16′	18	0.5
	9697	8 Mar. 69	I	Englewood, Fla.	26°57′	82°22′	735	*
	9698	7 Mar. 67	I	Englewood Bch., Fla.	26°57′	82°23′	3	7.3
	9699	7 Mar. 67	I	Manasota Key, Fla.	26°57′	82°23′	3	7.0
	9700	7 Mar. 67	I	Manasota Key, Fla.	26°57′	82°23′	3	7.0
I #9611-9620 8 Mar.	9611	31 May 68	IV	S Mustang Is., Tex.	27°11′	97°22′	450	*
	9616	11 May 67	V	Delray Bch., Fla.	26°28′	80°04′	64	5.7
J #9631-9640 8 Mar.	9631	12 June 67	V	Key West, Fla.	24°33′	81°46′	96	1.9
	9634	9 June 67	V	Pompano Bch., Fla.	26°16′	80°05′	93	3.7
	9635	9 Nov. 67	V	Key Largo, Fla.	25°02′	80°29′	246	0.7
	9638	22 Apr. 67	V	Jupiter Inlet, Fla.	26°56′	80°04′	45	8.6
	9639	24 May 67	V	Duck Key, Fla.	24°46′	80°55′	77	2.9
	9640	26 Jan. 68	V	Saddle Bunch Key, Fla.	24°37′	81°36′	324	0.6
K #9641-9650 8 Mar.	9647	13 Apr. 67	V	Miami, Fla.	25°42′	80°15′	36	8.6
L #9651-9660 9 Mar.		No returns						
M #9661-9670 9 Mar.	9661	28 Mar. 67	V	Palm Bch., Fla.	26°46′	80°02′	19	20.1
	9662	26 Apr. 67	V	Jupiter, Fla.	26°56′	80°04′	48	8.4
	9664	20 May 67	V	Key West, Fla.	24°33′	81°46′	72	2.7
	9665	28 Mar. 67	V	Delray Bch., Fla.	26°28′	80°04′	19	19.6
	9666	28 Mar. 67	V	Boynton Bch., Fla.	26°32′	80°03′	19	19.8
	9670	27 Mar. 67	V	Pompano Bch., Fla.	26°13′	80°05′	18	19.9

Cruise No.: HC 37 (Continued) 2-10 March 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
N #9701-9710	9705	19 May 67	V	Miami Bch., Fla.	25°48′	80°08′	70	5.1
10 Mar.	9706	12 July 67	V	Geiger Key, Fla.	24°34′	81°39′	124	1.8
O #9711-9720	9714	2 May 70	V	Julia Is., Fla.	25°07′	80°23′	1149	*
10 Mar.	9719	28 Oct. 67	V	Saddle Hill Key, Fla.	24°33′	81°38′	232	1.0
P #9721-9730	9722	17 Sept. 67	V	Floridana Bch., Fla.	27°57′	80°30′	191	2.8
10 Mar.	9723	27 May 68	V	Windley Key, Fla.	24°57′	80°36′	444	*
	9724	3 July 67	V	Key West, Fla.	24°33′	81°46′	115	2.2
	9725	7 Oct. 67	V	Key West, Fla.	24°33′	81°46′	211	1.2
	9726	9 Aug. 67	V	Walkers Is., Conch Key, Fla.	24°47′	80°53′	152	1.9
	9729	13 Apr. 67	V	Key West, Fla.	24°33′	81°46′	34	7.4
	9730	24 Nov. 67	V	Ocean Reef, Key Largo, Fla.	25°19′	80°16′	259	1.4

Cruise No.: HC 38 3-9 April 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #9731-9740	9731	21 May 67	II	Cedar Key, Fla.	29°08′	83°02′	48	2.0
3 Apr.	9738	21 May 67	II	Cedar Key, Fla.	29°08′	83°02′	48	2.0
B #9741-9750	9743	25 June 67	II	Between Dog Is. & Cedar Key, Fla.	29°08′	83°02′	83	1.1
3 Apr.	9746	19 Jan. 69	V	Key Largo, Fla.	25°08′	80°22′	657	*
	9747	5 Aug. 67	II	Horseshoe Pt., Fla.	29°26′	83°18′	124	1.0
C #9751-9760	9756	31 Jan. 71	V	Big Pine Key, Fla.	24°39′	81°22′	1399	*
3 Apr.	9757	8 Mar. 68	II	Chambers Is., Pt. Inglis, Fla.	28°59′	82°46′	340	0.3
D #9761-9770	9762	19 Aug. 67	V	Miami Bch., Fla.	25°48′	80°08′	137	2.9
4 Apr.	9764	29 June 68	IV	Bolivar Peninsula, Tex.	29°26′	94°40′	452	*
	9769	16 Sept. 67	V	Islamorada, Fla.	24°56′	80°37′	165	2.0
	9770	8 Oct. 67	V	Elliott Key, Fla.	25°26′	80°12′	187	2.0
E #9771-9780	9774	17 Apr. 68	V	Miami, Fla.	25°38′	80°16′	379	*
4 Apr.	9779	8 Oct. 68	II	Dog Is., Cedar Key, Fla.	29°08′	83°01′	553	*

Cruise No.: HC 38 (Continued) 3-9 April 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
F #9781-9790	9783	20 Aug. 67	V	Marathon, Fla.	24°43′	81°06′	137	1.8
5 Apr.	9787	20 Oct. 70	V	Key West, Fla.	24°33′	81°46′	1294	*
	9789	17 July 67	V	Miami Bch., Fla.	25°48′	80°08′	103	3.5
G #9791-9800	9794	6 July 68	IV	Isle Derniere, La.	29°02′	90°49′	458	*
5 Apr.	9795	4 July 67	I	Dunedin, Fla.	27°59′	82°50′	90	0.9
	9797	11 May 68	II	Seahorse Key, Cedar Key, Fla.	29°06′	83°04′	402	*
H #9801-9810	9801	1 May 67	I	N Manasota Key, Fla.	27°00′	82°26′	26	1.0
5 Apr.	9802	27 Apr. 67	I	Manasota Bch., Fla.	27°01′	82°25′	22	1.0
	9803	26 Apr. 67	I	Manasota Bch., Fla.	27°01′	82°25′	21	1.2
	9804	27 Apr. 67	I	Venice, Fla.	27°06′	82°29′	22	1.4
	9805	27 Apr. 67	I	S Venice, Fla.	27°04′	82°27′	22	1.4
	9808	27 Apr. 67	I	Venice, Fla.	27°06′	82°29′	22	1.4
	9809	27 Apr. 67	I	Venice, Fla.	27°06′	82°29′	22	1.4
	9810	2 May 67	I	N Manasota Key, Fla.	27°00′	82°26′	27	0.9
I #9811-9820	9812	26 Apr. 67	I	Placida, Fla.	26°51′	82°19′	19	1.6
7 Apr.	9813	24 Apr. 67	I	Boca Grande, Fla.	26°44′	82°16′	17	2.7
	9814	3 May 67	I	Placida, Fla.	26°51′	82°19′	26	1.2
	9815	30 Apr. 67	I	Little Gasparilla Is., Fla.	26°47′	82°15′	23	1.3
	9816	25 Apr. 67	I	Placida, Fla.	26°51′	82°19′	18	1.7
	9819	24 Apr. 67	I	Gasparilla Inlet, Fla.	26°47′	82°15′	17	1.7
	9820	24 Apr. 67	I	Boca Grande, Fla.	26°44′	82°16′	17	1.4
J #9821-9830	9822	18 May 67	II	Tarpon Spr., Fla.	28°10′	82°48′	41	2.8
7 Apr.	9825	20 June 67	II	Crystal Bch., Clearwater, Fla.	28°05′	82°47′	74	1.5
	9826	13 May 67	II	Caladesi Is., Fla.	28°03′	82°49′	36	2.8
	9827	14 May 67	II	Anclote Key, Fla.	28°12′	82°51′	37	3.0
	9828	13 May 67	I	Dunedin, Fla.	27°59′	82°50′	36	3.1
	9829	12 May 67	II	Caladesi Is., Fla.	28°02′	82°49′	35	2.9
K #9831-9840	9831	31 May 67	I	Crescent Bch., Sarasota, Fla.	27°19′	82°36′	54	1.1
7 Apr.	9834	16 May 67	I	Indian Rocks Bch., Fla.	27°53′	82°52′	39	2.4
	9835	2 Mar. 68	I	Siesta Key, Fla.	27°15′	82°33′	330	0.2
	9836	1 June 67	I	Sarasota, Fla.	27°19′	82°35′	55	1.1
	9837	31 May 67	I	Siesta Key, Fla.	27°19′	82°35′	54	1.1
	9838	14 July 68	IV	Grand Cheniere, La.	29°45′	93°06′	464	*
	9840	4 July 67	I	Venice, Fla.	27°06′	82°29′	88	0.6

Cruise No.: HC 38 (Continued) 3-9 April 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
L #9841-9850	9843	16 Sept. 67	V	Saddlebunch Key, Fla.	24°35′	81°38′	161	1.2
8 Apr.	9844	17 Sept. 67	V	Jensen Bch., Fla.	27°15′	80°12′	162	2.6
	9847	17 Aug. 67	I	Clearwater Bch., Fla.	27°58′	82°48′	131	0.8
M #9851-9860	9854	29 Aug. 67	V	Coco Plum Bch., Fla.	24°44′	81°02′	143	1.6
8 Apr.	9857	19 Feb. 73	V	Sugarloaf Key, Fla.	24°38′	81°31′	2144	*
	9859	19 June 67	V	Key West, Fla.	24°33′	81°49′	72	3.5
N #9861-9870	9864	12 May 68	IV	Padre Is., Tex.	27°19′	97°20′	399	*
9 Apr.								
O #9871-9880	9872	13 Mar. 73	II	Shired Is., Fla.	29°23′	83°13′	2165	*
9 Apr.	9874	10 May 67	II	Cedar Key, Fla.	29°08′	83°02′	31	3.6
P #9881-9890	9887	29 Sept. 73	II	S side Buck Is.,	29°09′	83°02′	2186	*
9 Apr.				Cedar Key, Fla.				

Cruise No.: HC 39 11-17 May 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #9891-9900	9891	14 May 67	I	St. Pete., Fla.	27°43′	82°45′	3	3.1
11 May	9895	13 May 67	I	St. Pete., Fla.	27°43′	82°45′	2	4.7
B #9901-9910	9901	5 Aug. 67	I	Dunedin Bch., Fla.	27°59′	82°50′	86	0.4
11 May	9902	15 July 67	I	St. Pete. Bch., Fla.	27°43′	82°45′	65	0.3
	9903	14 July 67	I	Treasure Is., Fla.	27°43′	82°49′	64	0.3
	9904	14 July 67	I	St. Pete., Fla.	27°43′	82°45′	64	0.3
	9906	14 July 67	I	Long Boat Key, Fla.	27°24′	82°41′	64	0.5
	9907	15 July 67	I	St. Pete., Fla.	27°43′	82°45′	65	0.3
	9910	15 July 67	I	Mullet Key, Fla.	27°37′	82°44′	65	0.3
C #9911-9920	9913	31 May 68	V	Big Pine Key, Fla.	24°39′	81°20′	386	*
11 May	9916	9 Aug. 67	V	Islamorada, Fla.	24°56′	80°37′	90	3.6
	9917	13 Jan. 68	V	Miami, Fla.	25°37′	81°18′	247	1.6
	9918	16 Sept. 67	V	Wabasso Bch., Fla.	27°46′	80°24′	128	4.1
D #9921-9930	9922	14 Dec. 69	V	Big Pine Key, Fla.	24°39′	81°20′	947	*
12 May	9926	5 Mar. 68	V	No Name Key, Fla.	24°41′	81°19′	298	1.0
	9927	5 Nov. 67	V	Sebastian Inlet, Fla.	27°51′	80°26′	177	3.0
	9930	8 July 67	V	Pompano Bch., Fla.	26°13′	80°05′	57	7.6

Cruise No.: HC 39 (Continued) 11-17 May 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
E #9931-9940	9932	10 Mar. 70	V	Key Largo, Fla.	25°05′	80°27′	1033	*
13 May	9938	26 Jan. 68	V	Saddlebunch Key, Fla.	24°36′	81°36′	259	1.1
F #9941-9950	9941	18 July 67	V	Tavernier, Fla.	25°01′	80°31′	66	4.6
13 May	9944	12 Nov. 67	V	Barracuda Key, Fla.	24°33′	81°50′	183	0.9
	9946	15 Sept. 67	V	Palm Bch., Fla.	26°42′	80°03′	125	3.3
	9947	4 Aug. 67	V	Miami, Fla.	25°42′	80°15′	83	4.2
	9949	15 Sept. 67	V	Wabasso, Fla.	27°46′	80°24′	125	3.9
G #9951-9960	9951	13 Aug. 67	V	Sands Key, Fla.	25°30′	80°05′	92	3.5
13 May	9952	14 July 67	V	Coco Plum Bch., Fla.	24°43′	81°06′	62	3.8
	9955	11 Aug. 67	V	Islamorada, Fla.	24°56′	80°37′	90	3.0
	9957	15 Sept. 67	V	Munson Is., Fla.	24°37′	81°24′	125	1.8
H #9961-9970	9962	19 June 67	I	Manasota Key, Fla.	26°56′	82°22′	37	0.6
13 May	9963	6 Aug. 67	I	Longboat Key, Fla.	27°24′	82°41′	85	0.5
	9966	14 May 67	I	Captiva Pass, Fla.	26°34′	82°13′	1	3.2
	9967	5 Aug. 67	I	Treasure Is., Fla.	27°46′	82°47′	84	1.1
	9968	17 May 67	I	Lacosta Is., Fla.	26°40′	82°15′	4	1.2
	9969	20 May 67	I	Lacosta Is., Fla.	26°43′	82°15′	7	0.9
I #9971-9980	9971	16 May 67	I	Sanibel Is., Fla.	26°26′	82°02′	1	3.2
15 May	9972	16 May 67	I	Sanibel Is., Fla.	26°26′	82°02′	1	3.2
	9973	16 May 67	I	Sanibel Is., Fla.	26°26′	82°02′	1	3.2
	9974	16 May 67	I	Sanibel Is., Fla.	26°26′	82°02′	1	3.2
	9975	16 May 67	I	Sanibel Is., Fla.	26°26′	82°02′	1	3.2
	9976	16 May 67	I	Sanibel Is., Fla.	26°26′	82°02′	1	3.2
	9977	16 May 67	I	Sanibel Is., Fla.	26°26′	82°02′	1	3.2
	9978	16 May 67	I	Sanibel Is., Fla.	26°26′	82°02′	1	3.2
	9979	16 May 67	I	Sanibel Is., Fla.	26°26′	82°02′	1	3.2
	9980	16 May 67	I	Sanibel Is., Fla.	26°26′	82°02′	1	3.2
J #9981-9990	9986	17 Sept. 67	V	Hallandale Bch., Fla.	25°59′	80°07′	125	2.7
15 May	9987	13 Sept. 67	V	Riviera Bch., Fla	26°46′	80°02′	121	3.1
	9988	16 Sept. 67	V	Riviera Bch., Fla.	26°50′	80°02′	124	3.1
	9989	25 Aug. 67	V	Islamorada, Fla.	24°56′	80°37′	102	2.4
	9990	30 July 67	V	Marathon, Fla.	24°44′	80°59′	76	2.9
K #9991-10000	9992	5 Oct. 68	V	N Key Largo, Fla.	25°19′	80°16′	509	*
15 May	9994	20 July 67	V	Vaca Key, Fla.	24°44′	81°02′	66	3.3
	9995	26 Aug. 67	V	Marathon, Fla.	24°43′	81°06′	103	2.1
	9996	7 July 67	V	Tavernier, Fla.	25°01′	80°31′	53	4.9
	9998	4 Feb. 71	V	Marathon, Fla.	24°43′	81°06′	1361	*

Cruise No.: HC 39 (Continued) 11-17 May 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
L #10001-10010	10001	6 Mar. 72	V	Marathon, Fla.	24°44′	81°02′	1756	*
16 May	10005	13 June 67	V	Marathon, Fla.	24°43′	81°06′	28	7.8
	10008	12 Sept. 67	V	Cape Kennedy, Fla.	28°24′	80°36′	119	4.2
	10009	7 Aug. 67	V	Coconut Grove, Fla.	25°43′	80°15′	83	3.8
	10010	28 Sept. 67	V	Marathon, Fla.	24°43′	81°06′	135	1.6
M #10011-10020	10012	16 June 67	N	Wrightsville Beach, N.C.	34°11′	77°48′	31	29.8+
16 May	10015	9 July 67	N	Emerald Isle, N.C.	34°41′	76°57′	54	19.5+
	10019	25 Aug. 67	N	Bald Head Is., N.C.	33°54′	77°57′	101	9.0+
N #10021-10030	10022	19 Dec. 67	V	Elliott Key, Fla.	25°26′	80°12′	216	1.6
17 May	10025	18 July 67	V	Grassy Key, Fla.	24°45′	80°57′	62	4.2
	10030	16 July 67	V	Geiger Key, Fla.	24°34′	81°39′	60	3.7
O #10031-10040	10033	3 Aug. 67	II	Caladesi Is., Fla.	28°02′	82°49′	78	0.6
17 May	10034	23 Aug. 67	V	Boca Chica, Fla.	24°34′	81°42′	98	2.4
	10035	16 Feb. 69	I	Clearwater Bay, Fla.	27°58′	82°49′	641	*
	10038	15 July 67	I	Longboat Key, Fla.	27°34′	82°41′	59	0.3
	10039	1 Aug. 67	I	Clearwater Bch., Fla.	27°58′	82°48′	76	0.5
P #10041-10050	10041	31 July 67	I	Indian Rocks Bch., Fla.	27°53′	82°52′	75	0.2
17 May	10042	13 July 67	I	Pass-a-Grille Bch., Fla.	27°42′	82°44′	57	0.1
	10043	12 July 67	I	St. Pete. Bch., Fla.	27°42′	82°44′	56	0.1
	10044	13 July 67	I	Pass-a-Grille Bch., Fla.	27°42′	82°44′	57	0.1
	10045	4 July 67	I	Casey Key, Fla.	27°12′	82°51′	48	0.7
	10046	14 July 67	I	St. Pete. Bch., Fla.	27°42′	82°44′	58	0.1
	10047	13 July 67	I	Pass-a-Grille Bch., Fla.	27°42′	82°44′	57	0.1
	10048	18 July 67	I	Sarasota Bay, Fla.	27°20′	82°34′	62	0.5
	10049	17 July 67	I	St. Pete. Bch., Fla.	27°42′	82°44′	61	0.2

Cruise No.: HC 40 2-8 June 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #10051-10060	10052	4 June 67	I	Egmont Key, Fla.	27°35′	82°45′	2	1.9
2 June	10054	4 June 67	I	Egmont Key, Fla.	27°35′	82°45′	2	1.9
	10055	11 June 67	I	Holmes Bch., Fla.	27°30′	82°43′	9	1.1
	10056	2 July 67	I	Egmont Key, Fla.	27°35′	82°45′	30	0.1
	10058	4 June 67	I	Egmont Channel, Fla.	27°37′	82°50′	2	0.6
	10060	18 June 67	I	Egmont Key, Fla.	27°35′	82°45′	16	0.2

Cruise No.: HC 40 (Continued) 2-8 June 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
B #10061-10070	10062	15 Sept. 67	V	New Smyrna Bch., Fla.	29°02′	80°54′	105	5.8
2 June	10064	16 July 67	V	Atlantic Ocean, 65 mi E of Key West, Fla.	24°32′	80°42′	44	6.9
	10069	28 Aug. 67	V	Big Pine Key, Fla.	24°37′	81°21′	87	3.1
	10070	1 Sept. 67	V	Key West, Fla.	24°33′	81°46′	91	2.8
C #10071-10080	10074	3 July 67	V	Summerland Key, Fla.	24°40′	81°27′	29	9.5
2 June								
D #10081-10090	10081	17 Feb. 68	V	Marquesas Keys, Fla.	24°35′	82°06′	259	0.8
3 June	10084	20 July 67	V	Cook Is., Fla.	24°38′	81°22′	47	6.0
	10085	31 Oct. 67	V	Painters Hill, Fla.	29°33′	81°10′	150	4.4
	10086	13 Aug. 67	V	Big Pine Key, Fla.	24°40′	81°21′	71	4.0
	10089	8 July 67	V	N Boca Raton, Fla.	26°21′	80°04′	35	12.5
E #10091-10100	10093	14 Sept. 67	V	Hollywood, Fla.	26°01′	80°07′	103	4.1
3 June	10095	13 July 67	V	Key Largo, Fla.	25°11′	80°22′	40	9.2
	10097	13 Aug. 67	V	S end Matacumbe Key, Fla.	24°51′	80°44′	71	4.6
	10100	6 Aug. 67	V	Sombrero Bch., Marathon, Fla.	24°43′	81°06′	64	4.7
F #10101-10110	10101	1 Aug. 67	V	Islamorada, Fla.	24°56′	80°37′	58	5.0
4 June	10102	28 July 67	V	N Miami Bch., Fla.	25°56′	80°07′	54	6.8
	10104	6 Aug. 67	V	Key Largo, Fla.	25°11′	80°22′	63	5.0
	10106	30 Jan. 71	V	Marquesas Keys, Fla.	24°35′	82°06′	1336	*
	10107	27 Aug. 67	V	Marathon, Fla.	24°43′	81°06′	84	3.0
	10108	25 Feb. 68	V	Little Pine Key, Fla.	24°43′	81°18′	266	0.9
G #10111-10120	10111	29 July 67	I	S Indian Rocks Bch., Fla.	27°53′	82°52′	55	1.3
4 June	10113	12 July 67	I	Pass-a-Grille Bch., Fla.	27°42′	82°44′	38	1.6
	10114	22 July 67	I	Pass-a-Grille Bch., Fla.	27°42′	82°44′	48	1.3
	10116	13 July 67	I	Mullet Key, Fla.	27°37′	82°44′	39	1.4
	10118	16 July 67	I	1 mi S of Sunshine Skyway, St. Pete., Fla.	27°36′	82°36′	42	1.1
	10119	16 July 67	I	Longboat Key, Fla.	27°24′	82°41′	42	1.0
	10120	14 July 67	I	Pass-a-Grille Bch., Fla.	27°42′	82°44′	40	1.5
H #10121-10130	10121	11 Aug. 67	I	Venice, Fla.	27°06′	82°29′	68	0.5
4 June	10122	9 Oct. 69	I	Pine Is., Fla.	26°34′	82°06′	858	*

Cruise No.: HC 40 (Continued) 2-8 June 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
H #10121-10130	10124	6 Apr. 71	V	Bahia Honda, Fla.	24°40′	81°16′	1557	*
4 June	10125	6 June 67	I	Captiva Is., Fla.	26°34′	82°13′	2	3.7
	10126	10 June 67	I	Captiva Is., Fla.	26°34′	82°13′	6	1.2
	10128	8 June 67	I	Captiva Is., Fla.	26°34′	82°13′	4	1.8
I #10131-10140	10131	9 June 67	I	Bonita Bch., Fla.	26°16′	81°49′	3	5.7
6 June	10132	10 June 67	I	Bonita Bch., Fla.	26°16′	81°49′	4	4.3
	10133	10 June 67	I	Bonita Bch., Fla.	26°16′	81°49′	4	4.3
	10135	10 June 67	I	Bonita Bch., Fla.	26°16′	81°49′	4	4.3
	10137	9 June 67	I	Bonita Bch., Fla.	26°16′	81°49′	3	5.7
J #10141-10150	10142	4 July 67	I	Manasota Bch., Fla.	27°01′	82°25′	28	1.3
6 June	10144	4 July 67	I	Manasota Bch., Fla.	27°01′	82°25′	28	1.3
	10145	3 July 67	I	Manasota Bch., Fla.	27°01′	82°25′	27	1.4
	10147	4 July 67	I	Englewood Bch., Fla.	26°57′	82°23′	28	1.2
	10150	6 July 67	I	Englewood Bch., Fla.	26°57′	82°23′	30	1.1
K #10151-10160	10152	5 Feb. 68	V	Key Largo, Fla.	25°19′	80°16′	244	1.2
6 June	10153	10 Feb. 68	V	Saddle Bunch Key, Fla.	24°37′	81°36′	249	0.8
	10154	4 Aug. 67	V	Bahia Honda, Fla.	24°40′	81°16′	59	3.5
	10155	15 Sept. 67	V	Ft. Lauderdale, Fla.	26°07′	80°06′	101	3.4
	10156	15 Sept. 67	V	Jensen Bch., Fla.	27°15′	80°12′	101	4.1
	10158	18 Feb. 69	V	Little Pine Key, Fla.	24°45′	81°19′	623	*
L #10161-10170	10161	7 Aug. 67	V	Boca Chica Key, Fla.	24°34′	81°42′	61	3.1
7 June	10163	9 May 75	V	Sugarloaf Key, Fla.	24°37′	81°31′	2922	*
	10164	10 Aug. 67	V	Key West, Fla.	24°33′	81°46′	64	2.9
	10169	24 July 67	V	Bahia Honda, Fla.	24°40′	81°16′	47	4.5
	10170	7 July 67	V	Lauderdale-by-the-Sea, Fla.	26°09′	80°06′	30	11.6
M #10171-10180	10171	20 Aug. 67	V	Key Largo, Fla.	25°19′	80°16′	74	4.1
7 June	10178	15 Sept. 67	V	Key Colony Bch., Marathon, Fla.	24°43′	81°06′	100	2.3
N #10181-10190	10182	3 Aug. 67	V	Key Colony Bch., Marathon, Fla.	24°43′	81°06′	56	4.5
8 June	10183	4 July 67	V	Miami, Fla.	25°43′	80°09′	26	13.5
	10186	12 Sept. 67	V	Lake Park, Fla.	26°48′	82°03′	96	4.3
	10188	6 Aug. 67	I	Anna Maria Is., Fla.	27°30′	82°43′	59	0.7
	10190	28 Feb. 69	V	Channel Key, Fla.	24°36′	80°43′	631	*

Cruise No.: HC 40 (Continued) 2-8 June 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
O #10191-10200	10191	1 Aug. 67	I	Clearwater Bch., Fla.	27°58′	82°50′	54	0.8
8 June	10193	1 Aug. 67	I	Belleaire Bch., Fla.	27°57′	82°51′	54	0.7
	10196	15 July 67	I	Anna Maria Is., Fla.	27°28′	82°43′	37	0.5
	10197	10 Nov. 67	V	Jensen Bch., Fla.	27°15′	80°12′	155	3.0
	10198	? Aug. 67	I	Clearwater Bch., Fla.	27°59′	82°50′	?	?
	10199	15 July 67	I	Mullet Key, Fla.	27°37′	82°44′	37	0.7
	10200	1 Aug. 67	I	Clearwater Bch., Fla.	27°59′	82°50′	54	0.8
P #10201-10210	10201	3 July 67	I	Longboat Key, Fla.	27°03′	82°38′	25	0.6
8 June	10202	3 July 67	I	Longboat Key, Fla.	27°03′	82°38′	25	0.6
	10203	4 Aug. 67	II	Honeymoon Is., Fla.	28°04′	82°50′	57	0.6

Cruise No.: HC 41 1-7 July 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #10211-10220	10213	13 July 67	I	Clearwater Bch., Fla.	27°58′	82°48′	12	2.1
1 July	10215	13 Oct. 68	I	Shell Is., St. Pete., Fla.	27°41′	82°44′	470	*
	10216	2 July 67	I	Egmont Key, Fla.	27°35′	82°45′	1	3.8
	10218	21 May 68	IV	Mustang Is., Tex.	27°37′	97°12′	325	2.4
	10219	17 June 67	I	Egmont Key, Fla.	27°35′	82°45′	?	?
	10220	4 July 67	I	Mullet Key, Fla.	27°37′	82°44′	3	1.9
B #10221-10230	10222	16 Apr. 71	IV	SW Pass, near Franklin, La.	29°35′	92°02′	1385	*
1 July	10229	22 May 68	IV	Padre Is., Tex.	26°34′	97°12′	326	2.3
C #10231-10240	10235	1 June 68	IV	Galveston, Tex.	29°13′	94°57′	336	1.8
1 July	10237	7 June 68	IV	Galveston, Tex.	29°17′	94°47′	342	2.0
	10239	22 June 68	IV	Sabine Pass, Tex.	29°38′	94°10′	357	1.6
D #10241-10250	10241	16 Aug. 67	V	Miami Bch., Fla.	25°48′	80°08′	45	8.9
2 July	10243	14 Oct. 67	V	Miami Bch., Fla.	25°48′	80°08′	104	3.9
	10244	12 Aug. 67	I	Anna Maria Is., Fla.	27°30′	82°43′	41	1.6
	10247	3 Aug. 68	IV	Port Arthur, Tex.	29°40′	93°57′	398	*
	10250	15 Sept. 67	I	Longboat Key, Fla.	27°26′	82°40′	75	0.9
E #10251-10260	10257	27 July 67	V	Islamorada, Fla.	24°56′	80°37′	25	13.5
2 July	10258	5 July 68	V	Big Pine Key, Fla.	24°37′	81°21′	369	*
	10259	4 Aug. 67	V	Big Pine Key, Fla.	24°37′	81°21′	33	8.8
	10260	28 July 67	V	Ft. Lauderdale, Fla.	26°07′	80°06′	26	16.6

Cruise No.: HC 41 (Continued) 1-7 July 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
F #10261-10270 3 July	10269	16 Aug. 67	I	Treasure Is., Fla.	27°46′	82°47′	44	1.2
G #10271-10280 3 July	10271	31 July 67	I	Clearwater Pass, Fla.	27°58′	82°48′	28	3.1
	10272	28 Oct. 67	I	Boca Ciega Bay, Fla.	27°46′	82°48′	117	0.6
	10274	27 July 67	I	Madeira Bch., Fla.	27°48′	82°48′	24	2.7
	10276	31 July 67	I	Clearwater Pass, Fla.	27°58′	82°48′	28	3.1
	10277	30 July 67	I	Clearwater Bch., Fla.	27°59′	82°50′	27	2.9
	10279	6 Aug. 67	I	Redington Bch., Fla.	27°52′	82°51′	34	2.0
H #10281-10290 3 July	10283	8 July 67	I	Lacosta Is., Fla.	26°42′	82°15′	5	0.8
	10284	22 Feb. 68	I	Lacosta Is., Fla.	26°42′	82°15′	234	0.02
	10285	9 July 67	I	Lacosta Is., Fla.	26°42′	82°15′	6	0.7
	10286	19 July 67	I	Lacosta Is., Fla.	26°42′	82°15′	16	0.3
	10288	19 July 67	I	Lacosta Is., Fla.	26°42′	82°15′	16	0.3
	10290	27 Dec. 67	I	Lacosta Is., Fla.	26°42′	82°15′	177	0.02
I #10291-10300 5 July	10291	29 July 67	I	Longboat Key, Fla.	27°23′	82°41′	24	2.9
	10292	27 July 67	I	Longboat Key, Fla.	27°23′	82°41′	22	3.2
	10293	28 July 67	I	Longboat Key, Fla.	27°23′	82°41′	23	3.1
	10294	29 July 67	I	Longboat Key, Fla.	27°23′	82°41′	24	2.9
	10295	28 July 67	I	Longboat Key, Fla.	27°23′	82°41′	23	3.1
	10296	29 July 67	I	Longboat Key, Fla.	27°26′	82°41′	24	3.0
	10297	27 July 67	I	Longboat Key, Fla.	27°23′	82°41′	22	3.2
	10298	28 July 67	I	Longboat Key, Fla.	27°23′	82°41′	23	3.1
	10299	28 July 67	I	Longboat Key, Fla.	27°23′	82°41′	23	3.1
J #10301-10310 5 July	10301	9 Aug. 67	I	Longboat Key, Fla.	27°20′	82°35′	35	1.7
	10303	6 Aug. 67	I	Longboat Key, Fla.	27°20′	82°35′	32	1.9
	10304	6 Aug. 67	I	Longboat Key, Fla.	27°21′	82°37′	32	2.0
	10305	6 Aug. 67	I	Longboat Key, Fla.	27°21′	82°37′	32	2.0
	10308	2 Aug. 67	I	Longboat Key, Fla.	27°20′	82°35′	28	2.2
	10310	10 Aug. 67	I	Longboat Key, Fla.	27°21′	82°37′	36	1.8
K #10311-10320 5 July	10311	8 Aug. 67	V	Sigsbee Pk. N of Key West, Fla.	24°35′	81°46′	34	5.3
	10313	15 Sept. 67	V	Melbourne Bch., Fla.	28°04′	80°33′	72	6.4
	10316	17 Aug. 67	V	Big Pine Key, Fla.	24°37′	81°20′	43	4.6
	10317	29 July 67	V	Ft. Lauderdale, Fla.	26°07′	80°06′	24	14.2
	10320	3 Aug. 67	V	Big Pine Key, Fla.	24°37′	81°21′	29	6.9

Cruise No.: HC 41 (Continued) 1-7 July 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
L #10321-10330	10323	2 Sept. 67	V	Bahia Honda, Fla.	24°40′	81°16′	58	3.6
6 July	10325	17 Sept. 67	V	Boca Chica Key, Fla.	24°34′	81°42′	73	2.6
	10326	28 Oct. 67	V	Marathon, Fla.	24°43′	81°06′	114	1.9
	10327	2 Oct. 67	V	Summerland Key, Fla.	24°40′	81°27′	88	2.3
	10330	29 Dec. 67	V	Marathon, Fla.	24°43′	81°06′	176	1.3
M #10331-10340	10331	22 Oct. 67	V	Rattlesnake Key, Fla.	25°10′	80°21′	108	2.7
6 July	10332	21 Jan. 68	V	No Name Key, Fla.	24°41′	81°19′	199	1.1
	10333	10 Sept. 67	V	Grassy Key, Fla.	24°45′	80°57′	66	3.6
	10340	27 Aug. 67	V	Miami, Fla.	25°48′	80°08′	52	2.9
N #10341-10350	10343	5 Aug. 67	I	Madeira Bch., Fla.	27°43′	82°44′	29	1.8
7 July	10344	1 Aug. 67	I	Madeira Bch., Fla.	27°43′	82°44′	25	2.0
	10345	1 Aug. 67	I	Belleaire Bch., Fla.	27°57′	82°51′	25	2.3
	10346	27 July 67	I	14 mi offshore John's Pass, Fla.	27°47′	83°02′	20	2.0
	10349	24 Aug. 67	II	Caladesi Is., Fla.	28°03′	82°49′	48	1.3
O #10351-10360	10352	21 Apr. 68	IV	Freeport, Tex.	28°57′	95°18′	289	2.3
7 July	10353	15 May 68	IV	Pass Cavallo, Tex.	28°21′	96°24′	313	2.4
P #10361-10370	10361	15 July 67	I	Belleaire Bch., Fla.	27°57′	82°51′	8	2.7
7 July	10362	15 July 67	I	Belleaire Bch., Fla.	27°57′	82°51′	8	2.7
	10363	15 July 67	I	Indian Rocks, Fla.	27°53′	82°52′	8	2.1
	10364	15 July 67	I	Belleaire Bch., Fla.	27°57′	82°51′	8	2.7
	10366	15 July 67	I	Belleaire Bch., Fla.	27°57′	82°51′	8	2.7
	10367	15 July 67	I	Indian Rocks, Fla.	27°53′	82°52′	8	2.1
	10369	15 July 67	I	Indian Rocks, Fla.	27°53′	82°52′	8	2.1
	10370	14 July 67	I	Belleaire Bch., Fla.	27°57′	82°51′	7	3.1

Cruise No.: HC 42 1-9 August 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #10371-10380	10371	6 Aug. 67	I	St. Pete. Bch., Fla.	27°43′	82°44′	5	2.0
1 Aug.	10372	22 Oct. 67	I	St. Pete. Bch., Fla.	27°44′	82°46′	87	0.1
	10373	6 Aug. 67	I	St. Pete. Bch., Fla.	27°46′	82°48′	5	2.9
	10375	6 Aug. 67	I	Treasure Is., Fla.	27°46′	82°47′	5	2.3
	10376	4 Aug. 67	I	Egmont Key, Fla.	27°35′	82°45′	3	1.2
	10377	2 Aug. 67	I	Tampa Bay, Fla.	27°37′	82°41′	1	9.3
	10380	5 Aug. 67	I	Mullet Key, Fla.	27°37′	82°44′	4	1.8

Cruise No.: HC 42 (Continued) 1-9 August 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
B #10381-10390	10382	27 Mar. 68	V	Ft. Pierce, Fla.	27°27′	80°17′	239	2.1
1 Aug.	10383	19 May 68	IV	Matagorda Is., Tex.	28°43′	95°53′	292	2.5
C #10391-10400	10391	12 June 68	IV	Rutherford Bch., La.	29°47′	93°19′	316	1.8
1 Aug.	10395	? May 69	IV	Padre Is., Tex.	27°31′	97°15′	?	?
D #10401-10410		No returns						
2 Aug.								
E #10411-10420	10411	17 June 68	IV	Holly Bch., La.	29°46′	93°17′	320	1.6
2 Aug.	10412	29 Sept. 71	IV	McFaddin Bch., La.	29°40′	93°57′	1519	*
	10418	6 July 68	IV	Padre Is., Tex.	26°31′	97°16′	339	2.1
F #10421-10430		No returns						
2 Aug.								
G #10431-10440	10431	1 Feb. 68	IV	Padre Is., Tex.	27°12′	97°23′	183	4.4
2 Aug.	10435	5 June 68	IV	High Is., Tex.	29°33′	94°23′	308	2.1
H #10441-10450	10441	6 Aug. 67	I	Manasota Bch., Fla.	27°01′	82°25′	4	6.5
2 Aug.	10442	11 Aug. 67	I	Sarasota, Fla.	27°19′	82°34′	9	5.3
	10443	12 Aug. 67	I	Longboat Key, Fla.	27°24′	82°41′	10	5.2
	10444	26 Aug. 67	I	Longboat Key, Fla.	27°24′	82°41′	24	2.2
	10445	30 Aug. 67	I	Englewood, Fla.	26°57′	82°22′	28	0.7
	10448	6 Aug. 67	I	Englewood, Fla.	26°57′	82°23′	4	5.3
	10450	6 Aug. 67	I	Manasota Key, Fla.	27°01′	82°25′	4	6.5
I #10451-10460	10451	? Nov. 67	I	Boca Grande, Fla.	26°45′	82°16′	?	?
7 Aug.	10452	3 Sept. 67	I	Gasparilla Is., Fla.	26°44′	82°16′	27	1.0
	10453	18 Feb. 68	I	Boca Grande, Fla.	26°44′	82°16′	195	0.1
	10454	16 Mar. 68	I	Gasparilla Is., Fla.	26°45′	82°16′	222	0.1
	10455	? Nov. 67	I	Boca Grande Bch., Fla.	26°45′	82°16′	?	?
	10457	20 Aug. 67	I	Gasparilla Is., Fla.	26°44′	82°16′	13	2.0
	10459	3 Sept. 67	I	Gasparilla Is., Fla.	26°44′	82°16′	27	1.0
	10460	3 Sept. 67	I	Gasparilla Is., Fla.	26°44′	82°16′	27	1.0
J #10461-10470	10461	13 Aug. 67	I	Manasota Bch., Fla.	27°01′	82°25′	6	6.1
7 Aug.	10462	13 Aug. 67	I	S Venice Bch., Fla.	27°06′	82°28′	6	6.9
	10463	13 Aug. 67	I	Manasota Bch., Fla.	27°01′	82°25′	6	6.1
	10464	13 Aug. 67	I	S Venice Bch., Fla.	27°06′	82°28′	6	6.9
	10465	13 Aug. 67	I	S Venice Bch., Fla.	27°06′	82°28′	6	6.9
	10466	13 Aug. 67	I	S Venice Bch., Fla.	27°06′	82°28′	6	6.9
	10467	13 Aug. 67	I	S Venice Bch., Fla.	27°06′	82°28′	6	6.9
	10468	13 Aug. 67	I	Manasota Bch., Fla.	27°01′	82°25′	6	6.1

Cruise No.: HC 42 (Continued) 1-9 August 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
J #10461-10470	10469	13 Aug. 67	I	S Venice Bch., Fla.	27°06′	82°28′	6	6.9
7 Aug.	10470	13 Aug. 67	I	S Venice Bch., Fla.	27°06′	82°28′	6	6.9
K #10471-10480	10475	25 Oct. 67	V	Hobe Sound, Fla.	27°04′	80°07′	79	5.0
7 Aug.	10476	25 Oct. 67	V	Lantana Bch., Fla.	26°35′	80°02′	79	4.7
	10477	22 Oct. 67	V	Jupiter Is., Fla.	27°09′	80°09′	76	5.1
	10479	22 Oct. 67	V	Boynton Inlet, Fla.	26°32′	80°03′	76	4.8
L #10481-10490	10485	12 May 68	IV	Mustang Is., Tex.	27°50′	97°03′	278	2.7
8 Aug.	10486	2 June 68	IV	Padre Is., Tex.	27°01′	97°23′	299	2.5
M #10491-10500	10493	20 Oct. 68	IV	Sargent Bch., Fla.	28°46′	95°37′	439	*
8 Aug.	10495	5 July 69	IV	Padre Is., Tex.	26°44′	97°20′	697	*
N #10501-10510	10504	24 May 68	IV	Padre Is., Tex.	27°10′	97°22′	289	2.6
9 Aug.								
O #10511-10520	10511	21 Apr. 68	IV	Padre Is., Tex.	26°22′	97°12′	258	3.0
9 Aug.	10515	17 Aug. 67	II	Honeymoon Is., Fla.	28°04′	82°50′	8	5.6
	10517	9 Mar. 69	IV	St. Joseph's Is., Tex.	28°00′	96°55′	578	*
	10518	17 Aug. 67	II	Honeymoon Is., Fla.	28°04′	82°50′	8	5.6
P #10521-10530	10521	13 Aug. 67	II	Caladesi Is., Fla.	28°02′	82°49′	4	7.5
9 Aug.	10522	14 Aug. 67	II	Dunedin, Fla.	28°04′	82°51′	5	6.0
	10523	13 Aug. 67	II	Caladesi Is., Fla.	28°02′	82°49′	4	7.5
	10524	18 Aug. 67	II	Caladesi Is., Fla.	28°02′	82°49′	9	3.1
	10527	14 Aug. 67	II	Dunedin, Fla.	28°04′	82°51′	5	6.0
	10529	18 Aug. 67	II	Caladesi Is., Fla.	28°02′	82°49′	9	3.1

Cruise No.: HC 43 31 August-6 September 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #10531-10540	10531	8 Aug. 68	I	Bradenton, Fla.	27°30′	82°35′	343	0.04
31 Aug.	10533	3 Sept. 67	I	Passage Key Inlet, Fla.	27°32′	82°45′	3	2.2
	10536	1 Sept. 67	I	Anna Maria Is., Fla.	27°28′	82°42′	1	6.5
	10537	29 Oct. 67	V	Jupiter Is., Fla.	26°56′	80°04′	59	7.8
	10538	22 Oct. 67	V	Boynton Bch., Fla.	26°32′	80°03′	52	8.3
	10539	3 Nov. 67	V	Floridana Bch., Fla.	27°57′	80°30′	64	8.2
B #10541-10550	10541	27 May 68	IV	Matagorda Is., Tex.	28°13′	96°38′	270	2.7
31 Aug.	10547	21 Apr. 68	IV	Padre Is., Tex.	27°25′	97°17′	234	3.3
	10548	3 Feb. 68	IV	Padre Is., Tex.	26°20′	97°21′	156	4.9

Cruise No.: HC 43 (Continued) 31 August-6 September 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
C #10551-10560 31 Aug.	10556	1 Nov. 67	V	Ft. Pierce, Fla.	27°27′	80°17′	62	8.2
D #10561-10570 1 Sept.	10564	26 Mar. 68	V	Miami Bch., Fla.	25°47′	80°08′	207	1.9
	10565	8 Apr. 68	IV	Brownsville, Tex.	26°02′	97°13′	220	3.3
	10567	27 Feb. 68	M	Matamoros, Mex.	26°03′	97°09′	179	4.0+
E #10571-10580 1 Sept.	10580	4 July 68	IV	Johnson's Bayou, La.	29°45′	93°40′	307	1.7
F #10581-10590 2 Sept.	10584	20 June 68	IV	NE of Galveston, Tex.	29°20′	94°46′	292	2.2
	10589	9 Nov. 67	V	Juno Bch., Fla.	26°52′	80°05′	68	6.2
	10590	25 May 68	IV	Mustang Is., Tex.	27°50′	97°03′	266	2.8
G #10591-10600 2 Sept.	10593	30 Oct. 67	V	Vero Bch., Fla.	27°39′	80°21′	58	7.8
	10598	8 Jan. 72	V	Elliott Key, Fla.	25°26′	80°12′	1589	*
	10599	22 Feb. 69	V	Jupiter, Fla.	26°57′	80°07′	539	*
H #10601-10610 2 Sept.	10602	25 Oct. 67	V	Hillsboro Bch., Fla.	26°16′	80°05′	53	6.8
	10603	22 Oct. 67	V	Ft. Lauderdale, Fla.	26°08′	80°60′	50	7.1
	10604	19 Feb. 70	V	Loxahatchee R., Jupiter, Fla.	26°56′	80°04′	901	*
	10605	9 Nov. 67	V	St. Lucie Inlet, Fla.	27°10′	80°10′	68	6.1
	10606	26 Oct. 67	V	Stuart, Fla.	27°12′	80°15′	54	7.9
	10609	29 Oct. 67	V	Vero Bch., Fla.	27°39′	80°21′	57	7.8
	10610	21 Oct. 67	V	Boca Raton, Fla.	26°21′	80°04′	49	7.5
I #10611-10620 4 Sept.	10611	17 Feb. 68	V	Key Largo, Fla.	25°05′	80°27′	166	1.6
	10614	22 Jan. 68	V	Long Key, Fla.	24°50′	80°47′	140	1.7
	10618	17 Nov. 67	V	Ponce de Leon Inlet, Fla.	29°04′	80°55′	74	7.3
J #10621-10630 4 Sept.	10624	30 Oct. 67	V	Plantation Key, Fla.	24°58′	80°33′	56	4.5
	10625	21 Oct. 67	V	Hollywood Bch., Fla.	26°01′	80°07′	47	7.1
	10629	3 Nov. 68	V	Tavernier, Fla.	25°01′	80°31′	426	*
K #10631-10640 4 Sept.	10632	30 Oct. 67	V	Miami Bch., Fla.	25°48′	80°08′	56	5.7
	10634	11 Nov. 67	V	Hobe Sound, Fla.	27°04′	80°07′	68	5.8
L #10641-10650 5 Sept.	10642	2 May 68	IV	Padre Is., Tex.	27°00′	97°24′	240	3.2
	10647	25 May 68	IV	Mustang Is., Tex.	27°50′	97°03′	263	2.8
M #10651-10660 5 Sept.		No returns						

Cruise No.: HC 43 (Continued) 31 August-6 September 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Coordinates Long. W	Days Adrift	nmi/ day
N #10661-10670 6 Sept.		No returns						
O #10671-10680 6 Sept.	10671	27 Oct. 67	V	Boca Raton, Fla.	26°21′	80°04′	51	8.0
	10672	25 Oct. 67	V	Hutchinson Is., Fla.	27°13′	80°10′	49	9.4
	10673	1 Nov. 67	V	Stuart Bch., Fla.	27°08′	80°07′	56	8.3
	10676	23 Oct. 67	V	Deerfield Bch., Fla.	26°19′	80°04′	47	8.6
	10678	28 Oct. 67	V	Jupiter Is., Fla.	26°57′	80°05′	52	8.5
	10679	25 Oct. 67	V	Boynton Bch., Fla.	26°32′	80°03′	49	8.5
	10680	2 Nov. 67	V	Jupiter Is., Fla.	26°57′	80°05′	57	7.8
P #10681-10690 6 Sept.	10681	11 Nov. 67	V	Daytona Bch., Fla.	29°13′	81°00′	66	9.3
	10682	22 Oct. 67	V	Plantation Key, Fla.	24°58′	80°33′	46	7.1
	10683	21 Oct. 67	V	Boynton Bch., Fla.	26°32′	80°03′	45	9.6
	10684	2 Nov. 67	V	Long Key, Fla.	24°49′	80°47′	57	5.3
	10687	5 Nov. 67	V	Old Rhodes Key, Fla.	25°22′	80°14′	60	6.0
	10688	16 Nov. 67	V	New Smyrna Bch., Fla.	28°53′	80°48′	71	8.4
	10690	23 Nov. 67	V	Miami Bch., Fla.	25°48′	80°08′	78	4.9

Cruise No.: HC 44 5-13 October 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Coordinates Long. W	Days Adrift	nmi/ day
A #10691-10700 5 Oct.	10691	21 Jan. 68	V	Rhodes Key, Fla.	25°22′	80°14′	108	3.3
	10692	10 Nov. 67	V	Vero Bch., Fla.	27°39′	80°21′	36	13.9
	10693	14 Nov. 67	V	Palm Bch., Fla.	26°42′	80°03′	40	11.0
	10695	11 Nov. 67	V	5 mi offshore Ft. Pierce, Fla.	27°33′	80°16′	37	13.5
	10696	10 Nov. 67	V	Jensen Bch., Fla.	27°15′	80°12′	36	13.3
	10699	11 Nov. 67	V	Vero Bch., Fla.	27°39′	80°21′	37	13.6
B #10701-10710 5 Oct.	10703	14 Jan. 68	V	Elliott Key, Fla.	25°26′	80°12′	101	3.6
	10706	12 Oct. 67	V	Stuart, Fla.	27°12′	80°15′	7	69.2
	10707	8 Dec. 67	V	Jensen Bch., Fla.	27°16′	80°15′	64	7.6
C #10711-10720 5 Oct.	10713	12 Apr. 68	V	Elliott Key, Fla.	25°26′	80°12′	190	2.0
	10717	9 Nov. 67	V	Singer Is., Fla.	26°48′	80°02′	35	13.0
	10719	4 Nov. 67	V	Port Everglades, Fla.	26°05′	80°07′	30	13.9
	10720	25 Nov. 67	V	Cape Kennedy, Fla.	28°36′	80°35′	51	11.4
D #10721-10730 6 Oct.	10721	? Nov. 67	V	Ft. Lauderdale, Fla.	26°07′	80°06′	?	?
	10722	10 Nov. 67	V	Juno Bch., Fla.	26°52′	80°05′	35	13.4

Cruise No.: 44 (Continued) 5-13 October 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
D #10721-10730	10723	19 Nov. 67	V	Channel No. 5, Fla.	24°50′	80°47′	44	7.3
6 Oct.	10725	9 Nov. 67	V	Hollywood Bch., Fla.	26°01′	80°07′	34	12.3
	10726	12 Nov. 67	V	Boynton Inlet, Fla.	26°32′	80°03′	37	12.1
	10727	25 Nov. 67	V	Boca Raton, Fla.	26°20′	80°04′	50	8.8
	10728	1 Jan. 70	V	Dove Key, Fla.	25°03′	80°29′	818	*
	10729	12 Nov. 67	V	Islamorada, Fla.	24°56′	80°37′	37	9.0
	10730	11 Nov. 67	V	Ft. Pierce, Fla.	27°27′	80°17′	36	14.2
E #10731-10740	10733	12 Nov. 67	V	Ft. Pierce, Fla.	27°27′	80°17′	37	14.0
6 Oct.	10736	17 Nov. 67	V	Hobe Sound, Fla.	27°04′	80°07′	42	11.6
F #10741-10750	10743	3 Dec. 67	V	Lake Park, Fla.	26°48′	80°02′	57	7.3
7 Oct.	10745	?	V	Lake Park, Fla.	26°48′	80°02′	?	?
G #10751-10760	10751	24 Nov. 67	V	Lantana Bch., Fla.	26°35′	80°02′	48	8.1
7 Oct.	10754	3 Dec. 67	V	Teatable Bridge, Fla.	24°54′	80°39′	57	4.6
	10755	22 Nov. 67	V	Jupiter Bch., Fla.	27°10′	80°09′	46	9.2
	10756	4 Nov. 67	V	Islamorada, Fla.	24°56′	80°37′	28	9.6
	10759	12 Nov. 67	V	Ft. Pierce, Fla.	27°27′	80°17′	36	12.4
H #10761-10770	10761	28 Oct. 67	I	Lacosta Is., Fla.	26°40′	82°15′	21	0.2
7 Oct.	10763	27 Oct. 67	I	Lacosta Is., Fla.	26°40′	82°15′	20	0.2
	10764	15 Oct. 67	I	Lacosta Is., Fla.	26°40′	82°15′	8	0.4
	10770	15 Oct. 67	I	Lacosta Is., Fla.	26°40′	82°15′	8	0.4
I #10771-10780	10774	20 Oct. 68	V	Miami, Fla.	25°46′	80°11′	375	*
11 Oct.	10778	3 Feb. 68	V	Hollywood Bch., Fla.	26°01′	80°07′	115	3.0
	10779	12 Nov. 67	V	Melbourne Bch., Fla.	28°04′	80°33′	32	14.6
J #10781-10790	10781	5 Nov. 67	V	N Key Largo, Fla.	25°22′	80°08′	25	11.5
11 Oct.	10784	13 Nov. 67	V	Key Largo, Fla.	25°05′	80°26′	33	8.1
	10785	5 Nov. 67	V	Long Key, Fla.	24°49′	80°47′	25	9.3
K #10791-10800	10797	1 Nov. 67	V	Vero Bch., Fla.	27°39′	80°21′	21	20.7
11 Oct.	10798	6 Nov. 67	V	Key Largo, Fla.	25°19′	80°16′	26	11.1
L #10801-10810		No returns						
12 Oct.								
M #10811-10820		No returns						
12 Oct.								
N #10821-10830	10824	21 Nov. 67	V	Cape Kennedy, Fla.	28°24′	80°36′	39	13.9
13 Oct.	10829	2 Dec. 67	V	Juno Bch., Fla.	26°52′	80°05′	50	8.5

Cruise No.: 44 (Continued) 5-13 October 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
O #10831-10840	10832	17 Nov. 67	V	S Delray Bch., Fla.	26°28′	80°04′	35	11.9
13 Oct.	10834	15 Nov. 67	V	Tavernier, Fla.	25°01′	80°31′	33	9.6
	10835	10 Nov. 67	V	Juno Bch., Fla.	26°52′	80°05′	28	15.7
	10836	23 Feb. 70	V	Tavernier, Fla.	25°00′	80°32′	848	*
	10837	21 Dec. 67	V	Hillsboro Bch., Fla.	25°16′	80°05′	69	5.9
	10839	6 Nov. 67	V	Tavernier, Fla.	25°01′	80°31′	24	13.1
	10840	9 Nov. 67	V	Juno Bch., Fla.	26°52′	80°05′	27	16.3
P #10841-10850	10848	2 Nov. 67	V	Hollywood, Fla.	26°01′	80°07′	20	20.2
13 Oct.	10850	10 Nov. 67	V	Miami Bch., Fla.	25°48′	80°08′	28	13.8

Cruise No.: HC 45 2-16 November 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
A #10851-10860	10852	22 Dec. 67	V	Hobe Sound, Fla.	27°04′	80°07′	50	9.3
2 Nov.	10854	3 Dec. 67	V	Hobe Sound, Fla.	27°04′	80°07′	31	15.0
	10858	1 Dec. 67	V	Upper Matecumbe Key, Fla.	24°55′	80°38′	29	10.9
	10860	1 Dec. 67	V	Juno Bch., Fla.	26°52′	80°05′	29	15.7
B #10861-10870		No returns						
2 Nov.								
C #10871-10880	10873	18 June 68	IV	At sea, 40 mi S of Morgan City, La.	28°32′	91°05′	229	1.8
2 Nov.	10875	23 Mar. 68	M	Alvarado, Mex.	18°47′	95°45′	142	5.9+
D #10881-10890	10882	17 Apr. 68	IV	Pt. Arthur, Tex.	29°40′	93°57′	166	3.3
3 Nov.	10889	27 Apr. 68	IV	Matagorda, Tex.	28°43′	95°53′	176	3.7
E #10891-10900	10892	28 Dec. 68	IV	St. Joseph Is., Tex.	28°00′	96°55′	421	*
3 Nov.	10895	3 June 69	IV	Barataria Pass, La.	29°17′	89°56′	578	*
	10898	21 Nov. 70	V	Bahia Honda Key, Fla.	24°40′	81°16′	1114	*
F 4 Nov.	Released at Station G							
G #10901-10920	10902	29 Nov. 67	V	Islamorada, Fla.	24°56′	80°37′	25	10.7
4 Nov.								
H #10921-10930	10930	3 Dec. 67	V	Boynton Bch., Fla.	26°32′	80°03′	29	13.0
4 Nov.								

Cruise No.: HC 45 (Continued) 2-16 November 1967

Station data	Bottle No.	Recovery Date	Area	Locality	Coordinates Lat. N	Long. W	Days Adrift	nmi/ day
I #10931-10940	10933	9 Jan. 68	V	Miami Bch., Fla.	25°48′	80°08′	56	5.7
14 Nov.	10934	23 Mar. 68	V	Elliott Key, Fla.	25°26′	80°12′	130	2.3
	10937	19 Jan. 68	V	Miami, Fla.	25°47′	80°10′	66	4.9
J #10941-10950	10944	10 Jan. 68	V	Patrick AFB, Fla.	28°15′	80°36′	59	8.3
14 Nov.								
K #10951-10960	10951	25 Dec. 67	V	Summerland Key, Fla.	24°39′	81°26′	41	4.8
14 Nov.	10954	1 Mar. 69	V	Miami, Fla.	25°48′	80°08′	473	*
	10955	2 Dec. 67	V	Miami Bch., Fla.	25°48′	80°08′	18	17.6
	10956	9 Jan. 68	V	Hobe Sound, Fla.	27°04′	80°07′	56	7.1
	10957	6 Dec. 67	V	Jensen Bch., Fla.	27°15′	80°12′	22	18.7
	10960	18 Feb. 68	V	Boca Chica Key, Fla.	24°34′	81°42′	96	1.9
L #10961-10970	10961	19 May 68	V	Key Largo, Fla.	25°03′	80°27′	186	1.5
15 Nov.	10962	1 Dec. 67	V	Jupiter Is., Fla.	27°04′	80°07′	16	25.2
	10963	10 Jan. 68	V	Eau Gallie, Fla.	28°18′	80°35′	56	8.5
	10964	2 Dec. 67	V	Jupiter Is., Fla.	27°10′	80°09′	17	24.2
	10966	7 Dec. 67	V	Vero Bch., Fla.	27°39′	80°21′	22	20.0
	10968	29 Nov. 67	V	Juno Bch., Fla.	26°52′	80°05′	14	28.0
M #10971-10980	10971	22 Nov. 70	V	Saddlebunch Key, Fla.	24°37′	81°36′	1103	*
15 Nov.	10972	8 Dec. 67	V	Hutchinson Is., Fla.	27°13′	80°10′	23	18.8
	10973	13 Dec. 67	V	Riviera Bch., Fla.	26°51′	80°03′	28	13.9
	10974	29 Nov. 67	V	Port Everglades, Fla.	26°05′	80°07′	14	25.0
N #10981-10990	10981	14 Dec. 67	V	Windley Key, Fla.	24°57′	80°32′	28	10.4
16 Nov.	10982	20 Nov. 70	V	Saddlebunch Key, Fla.	24°37′	81°36′	1039	*
	10983	16 Dec. 67	V	Summerland Key, Fla.	24°40′	81°27′	30	7.9
	10988	2 Dec. 67	V	Miami, Fla.	25°43′	80°09′	16	22.0
	10989	19 Dec. 67	V	Hillsboro Bch., Fla.	26°16′	80°05′	33	11.8
O #10991-11000	10994	10 Dec. 67	V	Dove Key, Fla.	25°03′	80°29′	24	13.3
16 Nov.	11000	9 Feb. 69	V	Ramrod Key, Fla.	24°40′	81°27′	451	*
P #11001-11010	11003	15 Apr. 68	M	Veracruz, Mex.	18°47′	95°05′	151	5.5+
16 Nov.	11008	23 Mar. 68	V	Islamorada, Fla.	24°56′	80°37′	128	2.5

APPENDIX II

TEMPERATURE AND SALINITY OF THE HOURGLASS STATIONS

Symbol	Definition
*	These temperatures and salinities were determined using an electrodeless induction salinometer. Mechanical and calibration problems prevented the continued use of this equipment.
---	Not attempted.
◆	Data not recorded.
?	Data recorded, but accuracy doubtful. (In these few instances, data have been recorded which are so inconsistent with related observations that accuracy is highly questionable. These figures are available, but not included).

	Temperature (°C)			Salinity (°/oo)		
	Surface	Mid	Bottom	Surface	Mid	Bottom
HC 18 Aug. 1965 Station						
A	28.5	---	28.8	?	---	?
B	29.0	---	29.0	?	---	?
C	28.5	---	25.8	?	---	?
D	28.0	---	20.0	?	---	?
E	25.5	---	?	?	---	?
F	29.0	28.5	24.5	?	?	?
G	29.5	29.5	29.8	?	?	?
H	30.2	30.5	30.0	?	?	?
I	29.7	---	29.5	?	---	?
J	30.2	---	30.0	?	---	?
K	29.0	---	24.8	?	---	?
L	29.0	---	19.6	?	---	?
M	29.5	---	17.2	?	---	?
N	29.2	28.7	23.2	?	?	?
O	29.3	29.3	29.3	?	?	?
P	29.8	29.8	29.8	?	?	?
HC 19 Sept. 1965 Station						
A	30.7	---	30.5	32.94	---	32.63
B	29.7	---	27.9	36.06	---	35.34
C	29.5	---	23.2	34.54	---	36.19
D	29.7	---	21.2	35.51	---	36.21

	Temperature (°C)			Salinity (°/oo)		
	Surface	Mid	Bottom	Surface	Mid	Bottom
HC 19 (Continued)						
Sept. 1965						
Station						
E	29.8	—	21.3	36.00	—	36.35
F	28.4	28.6	23.0	35.44	35.73	36.23
G	30.0	30.0	27.8	36.16	36.21	36.21
H	31.2	31.0	30.7	32.72	35.51	36.02
I	29.8	—	29.6	34.59	—	35.13
J	29.5	—	28.1	36.21	—	36.19
K	28.8	—	22.0	35.11	—	36.04
L	28.5	—	25.4	36.09	—	36.28
M	28.3	—	24.8	36.19	—	36.31
N	28.9	28.7	22.2	31.42	34.08	30.49
O	29.9	29.7	27.5	35.58	35.68	35.46
P	30.4	30.3	30.2	34.68	?	?
HC 20						
Oct. 1965						
Station						
A	28.0	—	27.8	35.28	—	34.61
B	28.0	—	27.0	35.71	—	35.74
C	27.5	—	24.5	35.70	—	36.02
D	27.0	—	24.5	35.52	—	36.09
E	28.5	—	26.0	35.95	—	36.12
F	27.5	27.0	25.0	35.93	35.70	36.18
G	28.0	27.5	26.5	35.87	33.61	34.01
H	29.0	29.0	29.0	34.51	35.09	35.25
I	*24.44	—	*23.80	*34.76	—	*35.88
J	*28.04	—	*25.96	*35.48	—	*35.96
K	*27.52	—	*24.72	*35.80	—	*36.00
L	*27.52	—	*23.76	*34.40	—	*35.96
M	*27.68	—	*24.24	*35.72	—	*36.04
N	26.5	26.5	24.5	35.78	35.64	36.19
O	26.0	26.0	25.0	35.46	35.59	35.87
P	26.0	26.0	25.5	34.03	34.01	33.96
HC 21						
Nov. 1965						
Station						
A	*21.80	—	*21.80	*32.20	—	*32.32
B	*23.12	—	*23.28	*35.00	—	*35.00
C	*23.56	—	*23.52	*35.20	—	*35.00
D	*24.68	—	*24.68	*35.60	—	*35.60
E	*25.08	—	*24.88	*35.64	—	*35.64
F	24.5	24.0	24.5	35.84	35.62	35.83
G	24.0	23.5	23.5	35.52	35.48	35.47

	Temperature (°C)			Salinity (°/₀₀)		
	Surface	Mid	Bottom	Surface	Mid	Bottom
HC 21 (Continued)						
Nov. 1965						
Station						
H	23.0	23.0	22.0	34.81	34.87	35.19
I	*23.72	---	*23.36	*34.44	---	*30.24
J	*23.68	---	*23.24	*34.88	---	*35.32
K	*24.60	---	*27.96	*35.36	---	*35.44
L	*25.28	---	*25.00	*35.56	---	*35.40
M	*25.64	---	*25.60	*35.76	---	*35.72
N	23.5	23.5	23.5	35.81	35.80	35.84
O	22.5	23.0	23.0	34.68	34.65	35.43
P	23.0	23.0	22.5	33.14	33.11	33.06
HC 22						
Dec. 1965						
Station						
A	18.5	---	18.5	33.05	---	32.84
B	20.5	---	20.5	35.16	---	35.19
C	21.5	---	21.5	35.54	---	35.80
D	23.0	---	23.0	36.16	---	36.16
E	23.0	---	20.0	36.19	---	36.36
F	22.0	22.0	22.0	35.87	35.87	35.93
G	21.0	21.0	21.0	35.32	35.32	35.32
H	19.5	19.5	19.5	34.83	34.89	34.95
I	19.5	---	19.5	34.82	---	34.99
J	20.5	---	20.5	35.25	---	35.18
K	22.0	---	21.5	35.54	---	36.11
L	25.0	---	---	---	---	---
M	25.3	---	23.2	36.12	---	36.43
N	21.5	21.3	21.3	36.04	35.95	36.00
O	19.8	19.7	20.0	35.25	35.54	35.63
P	18.2	18.2	18.4	33.05	33.20	33.79
HC 23						
Jan. 1966						
Station						
A	19.0	---	19.0	32.58	---	33.51
B	19.2	---	18.7	34.92	---	35.30
C	20.2	---	20.2	36.09	---	36.06
D	22.0	---	21.2	36.31	---	36.36
E	22.0	---	21.5	36.38	---	36.20
F	21.0	21.0	20.5	36.14	36.04	35.97
G	20.8	20.1	20.5	35.34	35.37	35.56
H	20.5	20.0	19.5	33.77	34.46	34.70
I	19.0	---	19.0	34.35	---	34.34

	Temperature (°C)			Salinity (°/oo)		
	Surface	Mid	Bottom	Surface	Mid	Bottom
HC 23 (Continued)						
Jan. 1966						
Station						
J	19.5	—	19.0	35.47	—	35.46
K	20.0	—	19.7	36.07	—	36.07
L	22.0	—	21.5	36.33	—	35.85
M	23.0	—	22.0	36.33	—	36.40
N	19.5	19.5	19.5	35.92	35.92	35.92
O	18.5	18.5	18.5	35.01	34.94	35.30
P	18.5	18.5	18.5	34.03	34.03	34.03
HC 24						
Feb. 1966						
Station						
A	*11.22	—	*11.30	31.91	—	*29.8
B	13.6	—	13.9	35.23	—	*33.0
C	*16.65	—	*15.85	36.24	—	*33.40
D	*20.40	—	*18.75	36.50	—	*33.82
E	*19.76	—	*19.99	36.47	—	*34.0
F	17.5	17.5	17.5	36.06	36.12	36.09
G	19.0	16.0	16.0	35.09	35.16	35.19
H	15.5	14.0	14.0	32.87	33.23	33.23
I	*17.06	—	*15.50	*31.30	—	*31.56
J	*16.64	—	*16.44	*32.81	—	*32.84
K	*19.0	—	*18.7	*33.8	—	*33.66
L	*20.52	—	*18.84	*33.92	—	*33.92
M	*21.2	—	*19.4	*33.88	—	*33.94
N	20.0	20.0	18.5	36.33	36.36	36.19
O	17.0	17.0	17.0	35.18	35.27	35.34
P	18.0	17.5	17.0	32.82	32.63	32.87
HC 25						
Mar. 1966						
Station						
A	*20.41	—	*19.46	33.79	—	*31.16
B	*20.16	—	*20.00	34.64	—	*31.22
C	*21.2	—	*19.52	36.09	—	*32.26
D	*21.4	—	*20.24	36.19	—	*32.54
E	*21.46	—	*20.85	36.21	—	*32.65
F	19.0	18.5	18.0	36.02	36.16	36.24
G	19.0	19.0	19.5	35.16	35.21	35.21
H	20.5	20.5	20.5	34.03	34.03	34.01
I	18.7	—	17.9	—	—	—
J	18.0	—	17.5	—	—	—
K	—	—	—	—	—	—

	Temperature (°C)			Salinity (°/oo)		
	Surface	Mid	Bottom	Surface	Mid	Bottom
HC 25 (Continued)						
Mar. 1966						
Station						
L	20.7	—	19.5	36.43	—	36.41
M	20.7	—	19.5	36.47	—	36.35
N	20.5	19.0	20.5	35.85	36.19	36.16
O	20.0	18.0	18.5	34.23	35.59	35.56
P	20.0	19.5	19.5	33.41	33.70	33.94
HC 26						
Apr. 1966						
Station						
A	19.5	—	19.5	33.67	—	33.80
B	18.5	—	18.0	34.64	—	35.83
C	19.0	—	18.5	36.33	—	36.06
D	19.5	—	18.5	36.45	—	36.28
E	19.5	—	17.5	36.41	—	36.19
F	19.0	19.5	18.5	35.54	36.14	36.33
G	20.0	19.5	19.5	34.92	35.02	35.97
H	21.5	21.5	21.5	34.70	34.68	34.90
I	21.5	—	21.5	34.68	—	34.89
J	20.5	—	20.0	35.50	—	35.71
K	20.5	—	19.5	35.92	—	36.33
L	20.5	—	19.5	36.43	—	36.45
M	20.0	—	18.0	36.35	—	36.30
N	20.0	20.0	19.0	35.70	36.23	36.31
O	20.0	19.5	20.0	34.75	34.85	35.92
P	21.5	20.5	21.5	34.85	34.83	34.87
HC 27						
May 1966						
Station						
A	26.0	—	26.0	35.07	—	35.09
B	23.5	—	22.5	35.02	—	34.99
C	23.0	—	20.0	36.14	—	36.07
D	23.5	—	19.5	35.99	—	36.31
E	23.5	—	18.5	35.80	—	36.19
F	23.5	22.0	20.0	36.33	36.28	36.16
G	24.5	24.5	23.5	35.64	35.61	35.51
H	26.5	26.0	26.5	34.52	34.77	35.18
I	27.0	—	26.0	35.06	—	35.09
J	25.0	—	24.0	35.56	—	35.50
K	23.5	—	21.5	36.12	—	36.24
L	24.0	—	20.0	36.00	—	36.33
M	24.5	—	20.0	36.16	—	36.36

	Temperature (°C)			Salinity (°/oo)		
	Surface	Mid	Bottom	Surface	Mid	Bottom
HC 27 (Continued)						
May 1966						
Station						
N	24.5	24.0	21.5	36.00	36.06	36.18
O	24.8	24.5	25.0	35.39	35.35	35.37
P	26.0	26.0	26.0	34.97	34.92	34.95
HC 28						
June 1966						
Station						
A	27.0	—	27.0	34.85	—	34.92
B	26.5	—	25.5	35.58	—	35.61
C	25.5	—	21.0	35.97	—	36.06
D	25.0	—	19.0	35.87	—	36.02
E	25.0	—	19.0	35.35	—	35.97
F	26.5	24.0	22.5	35.74	36.02	36.06
G	26.5	26.5	25.5	35.39	35.39	35.83
H	27.0	27.0	27.0	34.23	34.39	34.97
I	29.0	—	28.0	35.19	—	35.34
J	28.5	—	26.0	35.87	—	36.04
K	28.0	—	23.0	36.26	—	36.26
L	26.0	—	25.5	36.11	—	36.26
M	25.5	—	19.5	35.97	—	36.26
N	26.5	22.5	22.5	35.90	36.21	36.24
O	27.5	26.5	26.5	35.85	35.66	35.78
P	29.5	27.5	27.5	34.94	35.32	35.19
HC 29						
July 1966						
Station						
A	28.0	—	28.0	35.09	—	35.13
B	28.0	—	27.5	35.85	—	35.78
C	27.0	—	22.5	36.07	—	36.31
D	26.5	—	?	35.97	—	36.00
E	26.5	—	20.0	36.26	—	35.54
F	27.0	26.0	23.0	36.09	36.06	36.28
G	29.0	27.5	28.0	35.82	35.50	35.90
H	30.0	29.0	29.5	34.85	33.60	35.25
I	29.0	—	29.0	35.28	—	35.44
J	29.5	—	27.0	34.82	—	35.83
K	28.0	—	23.0	36.23	—	36.26
L	27.5	—	21.0	36.06	—	36.31
M	27.5	—	19.0	35.99	—	36.16
N	28.0	26.0	23.0	36.04	35.83	36.19
O	28.5	28.5	28.0	35.63	35.56	35.85
P	29.0	29.0	28.0	34.94	34.97	35.35

	Temperature (°C)			Salinity (°/₀₀)		
	Surface	Mid	Bottom	Surface	Mid	Bottom
HC 30 Aug. 1966 Station						
A	30.0	—	30.0	34.44	—	34.51
B	29.5	—	28.0	♦	—	36.16
C	29.0	—	23.5	36.06	—	36.43
D	28.5	—	21.0	35.85	—	36.40
E	28.5	—	19.0	34.66	—	36.28
F	28.5	27.0	24.0	36.18	36.21	36.55
G	30.5	30.0	29.0	36.31	35.73	36.02
H	31.5	31.5	31.5	32.63	34.11	34.11
I	31.5	—	31.0	31.53	—	32.42
J	30.5	—	28.0	35.07	—	36.04
K	29.0	—	24.0	36.04	—	36.19
L	29.5	—	21.5	35.63	—	36.23
M	29.0	—	19.0	35.25	—	36.23
N	29.0	28.5	24.5	36.11	36.11	36.35
O	30.0	30.0	29.0	35.82	35.85	36.06
P	31.0	31.0	31.0	35.47	35.39	35.46
HC 31 Sept. 1966 Station						
A	30.0	—	30.0	34.06	—	34.09
B	30.0	—	28.5	35.46	—	35.93
C	29.0	—	24.5	35.32	—	36.18
D	29.0	—	21.5	35.34	—	36.18
E	28.5	—	19.5	35.18	—	36.26
F	29.5	29.5	25.0	36.00	35.78	36.40
G	30.5	30.0	29.0	35.18	35.63	36.14
H	32.0	32.0	31.5	32.91	34.08	35.39
I	32.0	—	31.0	34.20	—	34.87
J	30.5	—	28.5	33.85	—	35.92
K	29.5	—	25.0	35.76	—	36.18
L	29.0	—	22.0	35.64	—	36.12
M	29.0	—	19.0	35.35	—	36.14
N	30.5	29.5	25.0	35.71	35.83	36.40
O	30.5	30.5	28.5	35.52	35.54	35.97
P	31.0	31.0	31.0	33.94	33.97	34.22
HC 32 Oct. 1966 Station						
A	28.5	—	28.0	32.20	—	33.18
B	28.5	—	27.8	35.59	—	35.74

	Temperature (°C)			Salinity (°/oo)		
	Surface	Mid	Bottom	Surface	Mid	Bottom
HC 32 (Continued)						
Oct. 1966						
Station						
C	28.0	—	24.5	35.76	—	36.35
D	28.0	—	22.0	35.52	—	36.35
E	27.5	—	20.0	35.61	—	36.28
F	28.0	28.0	25.0	35.61	35.52	36.14
G	28.5	28.5	28.5	35.39	35.46	35.52
H	29.0	29.0	29.0	31.87	32.32	33.99
I	29.0	—	28.5	34.30	—	34.49
J	28.5	—	28.0	35.02	—	35.83
K	28.0	—	26.0	35.85	—	36.12
L	28.0	—	23.0	35.92	—	36.23
M	28.0	—	21.5	35.78	—	36.33
N	27.5	27.5	25.5	35.66	35.63	36.14
O	27.5	27.5	27.5	35.46	35.42	35.34
P	27.5	27.5	27.5	34.44	34.49	34.51
HC 33						
Nov. 1966						
Station						
A	20.5	—	20.5	33.56	—	33.89
B	24.0	—	24.0	36.09	—	36.18
C	25.0	—	25.0	36.11	—	36.00
D	25.0	—	23.0	35.87	—	36.41
E	25.0	—	21.5	36.00	—	36.47
F	25.0	25.0	25.0	36.11	36.07	36.14
G	25.0	25.0	25.0	36.02	35.97	36.00
H	24.0	23.5	23.5	33.94	34.13	34.27
I	24.0	—	23.5	34.42	—	34.54
J	25.0	—	25.0	35.74	—	35.74
K	26.0	—	25.5	35.90	—	35.93
L	26.0	—	26.0	35.92	—	35.92
M	26.0	—	23.0	36.00	—	36.14
N	25.5	25.5	25.0	35.87	35.68	35.83
O	24.5	24.5	24.0	35.82	35.83	35.85
P	23.0	22.5	23.0	33.99	34.01	34.78
HC 34						
Dec. 1966						
Station						
A	18.0	—	18.0	32.67	—	33.22
B	20.0	—	20.0	35.18	—	35.16
C	22.0	—	22.0	35.95	—	35.90
D	23.0	—	23.0	35.95	—	35.83

	Temperature (°C)			Salinity (°/₀₀)		
	Surface	Mid	Bottom	Surface	Mid	Bottom
HC 34 (Continued)						
Dec. 1966						
Station						
E	23.0	—	23.0	35.97	—	35.99
F	22.0	22.0	22.0	35.99	35.92	35.88
G	22.0	21.5	21.0	35.25	35.27	35.23
H	19.5	19.0	18.5	34.46	34.47	34.44
I	19.5	—	19.5	34.64	—	34.51
J	21.0	—	21.0	35.44	—	35.58
K	22.5	—	22.5	36.04	—	36.18
L	24.0	—	24.0	36.12	—	36.09
M	24.0	—	24.0	36.21	—	36.18
N	22.5	22.5	22.0	36.16	36.07	36.09
O	20.5	20.5	20.0	35.39	35.39	35.39
P	19.0	19.0	18.5	33.49	33.39	33.48
HC 35						
Jan. 1967						
Station						
A	17.5	—	17.5	33.32	—	33.63
B	18.5	—	18.5	35.76	—	35.76
C	20.0	—	20.0	36.06	—	36.06
D	20.0	—	19.0	36.28	—	36.18
E	21.5	—	—	36.09	—	—
F	21.0	21.0	20.5	36.31	36.31	36.26
G	20.0	20.0	20.0	36.12	36.16	36.09
H	18.5	18.5	18.5	34.15	34.32	34.30
I	19.8	—	19.5	34.49	—	34.78
J	20.2	—	20.0	35.87	—	35.85
K	21.2	—	20.8	36.23	—	36.14
L	22.0	—	21.5	36.31	—	36.26
M	22.0	—	21.5	36.28	—	36.23
N	20.5	20.0	19.8	36.30	36.18	36.19
O	18.8	18.8	19.2	35.32	35.50	35.47
P	19.0	18.4	19.0	33.58	33.58	33.73
HC 36						
Feb. 1967						
Station						
A	17.5	—	17.5	34.34	—	34.47
B	17.5	—	16.5	35.58	—	35.85
C	19.0	—	18.0	36.09	—	36.04
D	20.0	—	18.5	36.30	—	36.09
E	21.0	—	20.0	36.24	—	36.23
F	19.0	19.0	19.0	35.93	36.14	36.16

	Temperature (°C)			Salinity (°/oo)		
	Surface	Mid	Bottom	Surface	Mid	Bottom
HC 36 (Continued)						
Feb. 1967						
Station						
G	18.5	18.5	18.0	35.52	35.61	35.85
H	19.0	19.0	19.0	35.06	35.13	35.06
I	19.5	—	18.5	34.95	—	35.07
J	19.0	—	18.5	35.85	—	35.85
K	18.5	—	18.5	36.16	—	36.07
L	20.0	—	19.5	36.35	—	36.23
M	21.0	—	20.5	36.40	—	36.40
N	18.5	18.5	18.5	36.19	36.19	36.16
O	18.5	17.5	17.5	35.61	35.63	35.74
P	17.5	18.5	18.0	34.30	34.59	34.71
HC 37						
Mar. 1967						
Station						
A	18.0	—	16.0	32.91	—	33.84
B	17.0	—	16.5	35.50	—	35.61
C	18.0	—	17.5	36.21	—	36.19
D	19.5	—	18.0	36.36	—	36.28
E	19.5	—	19.0	36.31	—	36.36
F	18.0	18.0	17.5	35.93	36.02	36.04
G	18.0	17.5	17.5	35.73	35.76	35.78
H	20.5	18.5	19.0	34.87	34.95	34.95
I	22.0	—	20.5	35.11	—	35.19
J	20.0	—	18.0	35.88	—	35.76
K	20.5	—	18.0	36.19	—	36.11
L	21.0	—	19.5	36.35	—	36.31
M	21.0	—	18.5	36.31	—	36.24
N	19.0	18.5	18.0	36.28	36.16	36.28
O	18.5	18.0	17.5	35.40	35.51	35.54
P	20.0	19.5	18.5	34.01	34.13	34.49
HC 38						
Apr. 1967						
Station						
A	21.5	—	21.5	34.30	—	34.64
B	21.0	—	20.0	35.42	—	35.71
C	20.0	—	19.0	36.14	—	36.11
D	21.5	—	19.5	36.23	—	36.30
E	22.0	—	19.5	36.30	—	36.24
F	20.5	20.5	19.5	36.26	36.33	36.19
G	21.5	21.0	21.0	35.78	35.82	35.95
H	23.0	22.5	22.5	35.56	35.56	35.56

	Temperature (°C)			Salinity (°/oo)		
	Surface	Mid	Bottom	Surface	Mid	Bottom
HC 38 (Continued)						
Apr. 1967						
Station						
I	23.0	—	22.5	35.63	—	35.63
J	22.0	—	21.0	35.64	—	35.70
K	22.5	—	20.5	36.43	—	36.24
L	22.5	—	19.5	36.45	—	36.24
M	23.0	—	20.0	36.59	—	36.43
N	21.5	21.0	20.0	36.31	36.38	36.24
O	22.0	21.5	20.5	35.34	35.35	35.95
P	22.5	22.5	22.5	34.94	35.02	35.07
HC 39						
May 1967						
Station						
A	26.5	—	26.5	35.71	—	35.74
B	25.0	—	24.5	36.00	—	36.09
C	24.5	—	22.0	36.36	—	36.19
D	25.0	—	21.0	36.26	—	36.24
E	24.5	—	19.5	36.24	—	36.19
F	25.5	24.5	22.0	36.52	36.55	36.30
G	26.5	25.5	25.5	36.14	36.11	36.14
H	28.5	28.0	28.0	36.52	36.52	36.59
I	28.0	—	28.0	35.92	—	35.92
J	26.5	—	25.5	35.93	—	35.83
K	25.5	—	22.5	36.30	—	36.06
L	26.0	—	21.0	36.35	—	36.00
M	25.0	—	21.0	36.23	—	36.11
N	25.5	24.0	22.0	36.36	36.18	36.06
O	25.5	25.5	25.0	35.92	35.85	35.97
P	27.5	27.5	27.5	35.82	35.76	35.80
HC 40						
June 1967						
Station						
A	28.5	—	28.5	35.95	—	35.97
B	27.0	—	24.0	36.07	—	36.18
C	26.0	—	21.5	36.38	—	36.21
D	26.0	—	18.5	36.31	—	36.14
E	26.0	—	18.5	36.38	—	36.14
F	26.5	22.5	22.0	36.50	36.19	36.21
G	27.5	27.0	24.5	36.33	36.26	36.26
H	30.0	29.0	29.0	36.41	36.38	36.31
I	29.0	—	28.5	36.30	—	36.28
J	28.0	—	25.5	36.16	—	36.24

	Temperature (°C)			Salinity (°/oo)		
	Surface	Mid	Bottom	Surface	Mid	Bottom
HC 40 (Continued)						
June 1967						
Station						
K	27.0	—	22.5	36.48	—	36.24
L	27.0	—	18.5	36.36	—	36.18
M	27.0	—	18.5	36.30	—	36.19
N	26.5	25.0	22.0	36.40	36.45	36.23
O	27.5	25.5	24.5	36.19	36.21	36.19
P	28.5	28.0	27.5	36.04	35.95	35.97
HC 41						
July 1967						
Station						
A	31.5	—	31.5	36.04	—	36.18
B	30.0	—	26.0	36.23	—	36.21
C	30.0	—	?	36.38	—	36.33
D	29.5	—	19.5	35.28	—	36.31
E	29.0	—	21.5	35.14	—	36.52
F	29.5	25.5	20.5	36.53	36.23	36.19
G	30.0	30.0	29.0	36.02	36.07	36.23
H	31.5	31.5	31.5	36.38	36.36	36.50
I	31.0	—	31.0	35.90	—	36.16
J	30.5	—	29.0	36.38	—	36.30
K	29.5	—	20.5	36.47	—	36.28
L	29.0	—	22.0	♦	—	36.60
M	29.0	—	22.5	36.19	—	36.65
N	29.5	26.0	20.0	36.35	36.07	36.24
O	30.0	30.0	28.0	36.28	36.30	36.28
P	30.5	30.5	30.5	36.16	36.18	36.12
HC 42						
Aug. 1967						
Station						
A	30.5	—	30.5	35.32	—	35.44
B	29.5	—	25.0	35.97	—	36.23
C	28.5	—	19.5	35.19	—	36.26
D	28.5	—	21.5	34.92	—	36.47
E	29.0	—	21.5	34.95	—	36.53
F	30.5	24.5	20.5	34.90	36.23	36.28
G	30.5	30.0	22.5	36.23	36.28	36.24
H	30.5	30.5	30.5	35.74	35.93	35.95
I	31.0	—	31.0	36.26	—	36.47
J	30.0	—	26.0	36.38	—	36.30
K	28.5	—	21.0	34.82	—	36.40
L	29.5	—	22.0	36.16	—	36.52

	Temperature (°C)			Salinity (°/oo)		
	Surface	Mid	Bottom	Surface	Mid	Bottom
HC 42 (Continued)						
Aug. 1967						
Station						
M	29.0	---	23.0	36.45	---	36.60
N	29.5	25.0	20.5	35.23	36.06	36.31
O	30.0	30.0	30.0	36.07	36.16	36.11
P	30.5	30.5	30.5	36.00	35.95	36.04
HC 43						
Sept. 1967						
Station						
A	30.5	---	30.5	33.86	---	34.85
B	29.5	---	25.0	35.57	---	36.26
C	29.0	---	22.0	34.72	---	36.47
D	28.5	---	22.5	35.50	---	36.55
E	28.5	---	21.0	35.19	---	36.55
F	29.0	29.0	21.0	35.30	35.28	36.31
G	29.5	29.5	24.5	35.48	35.44	36.17
H	30.5	30.5	30.5	35.43	35.55	35.68
I	30.5	---	30.5	35.79	---	35.86
J	29.5	---	25.0	34.61	---	36.15
K	29.0	---	22.0	35.41	---	36.45
L	28.0	---	21.5	35.48	---	36.71
M	29.0	---	21.0	35.88	---	36.67
N	29.0	28.5	21.0	35.57	35.50	36.49
O	29.0	29.0	25.0	35.50	35.50	36.22
P	29.5	29.5	29.5	34.60	35.01	35.01
HC 44						
Oct. 1967						
Station						
A	26.0	---	25.5	33.58	---	34.97
B	26.5	---	26.5	35.88	---	35.90
C	26.5	---	23.0	36.15	---	36.47
D	26.0	---	22.0	36.04	---	36.49
E	26.0	---	21.0	35.90	---	36.53
F	26.5	26.5	23.0	35.93	35.90	36.45
G	26.5	26.5	26.0	35.70	35.70	35.91
H	27.0	26.5	26.5	33.15	34.87	34.97
I	26.0	---	26.0	34.25	---	34.58
J	26.5	---	26.5	35.48	---	35.59
K	26.5	---	23.0	35.71	---	36.26
L	26.5	---	22.5	35.93	---	36.36
M	26.5	---	21.0	36.29	---	36.42
N	26.0	26.0	23.0	35.61	35.57	36.31

	Temperature (°C)			Salinity (°/oo)		
	Surface	Mid	Bottom	Surface	Mid	Bottom
HC 44 (Continued)						
Oct. 67						
Station						
O	25.5	25.5	25.5	35.62	35.64	35.68
P	25.0	25.0	25.0	34.88	34.90	34.96
HC 45						
Nov. 1967						
Station						
A	23.5	—	23.5	33.89	—	34.56
B	24.0	—	24.0	35.82	—	35.93
C	24.0	—	22.5	35.82	—	36.13
D	23.5	—	21.0	35.57	—	36.45
E	24.5	—	20.0	36.29	—	36.40
F	24.0	24.0	22.5	36.09	36.09	36.42
G	24.5	24.5	24.5	35.95	35.91	35.93
H	24.5	24.5	24.5	33.55	34.81	34.92
I	21.0	—	20.5	34.97	—	35.23
J	21.5	—	21.5	35.86	—	36.02
K	21.5	—	22.0	36.13	—	36.29
L	23.0	—	21.5	36.29	—	36.40
M	24.0	—	21.5	36.36	—	36.45
N	21.5	21.5	21.0	36.22	36.04	36.22
O	21.0	21.0	21.0	35.82	35.81	35.84
P	19.0	19.0	19.0	34.20	34.20	34.13